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ABSTRACT

This document, the first of five volumes that comprise the final report of the National Assessment of Vocational Education contains a policy statement by the Advisory Panel and a summary and recommendations. "The Future of Perkins--A Policy Statement" (Laurel McFarland) outlines three principles that the next Perkins Act should develop: the federal government should have a new role in supporting vocational education--fostering a truly comprehensive system of preparation for work; Perkins should become the principal vehicle for connecting skill standards and vocational education; and institutions and states should be held accountable for disadvantaged and special populations meeting skill standards. "Summary and Recommendations of the National Education" (David Boesel) has three parts. The first briefly discusses the condition of vocational education in secondary schools and nonbaccalaureate postsecondary institutions. The second part addresses questions posed in the Perkins mandate and issues related to those questions. It examines various aspects of program quality in vocational education, program improvement, equity issues related to special populations, and funding and administrative issues specified in the legislation. Recommendations based on the evidence in the report are made. The third section discusses some implications of the findings and suggests a model of occupational education consistent with them. Twenty-eight endnotes are appended. (YLB)

ED 371 191

FINAL REPORT TO CONGRESS

VOLUME I

SUMMARY AND RECOMMENDATIONS

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
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NATIONAL ASSESSMENT
OF VOCATIONAL EDUCATION

FINAL REPORT TO CONGRESS

VOLUME I

SUMMARY AND RECOMMENDATIONS

David Boesel
Laurel McFarland

Office of Research

Office of Educational Research and Improvement
U.S. Department of Education

July 1994

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PREFACE

The National Assessment of Vocational Education was mandated by the 1990 Carl D. Perkins Act (Section 403) and assigned to the Office of Educational Research and Improvement (OERI) in the U.S. Department of Education. The Assessment was conducted in the Office of Research (within OERI).

To help frame the issues and methodology of the Assessment, a Design Conference was held March 13-15, 1991 in Washington, D.C.

In the course of the research, an Independent Advisory Panel of distinguished experts and practitioners has met nine times to provide advice on all aspects of the study, including reviews of its reports.

The *Final Report* of the National Assessment substantially expands and updates the Assessment's *Interim Report*, presented to Congress in January, 1994. It includes seven new chapters: Educational Outcomes of Vocational Coursetaking (Volume II, Chapter 5); Employer Involvement and Satisfaction (Volume II, Chapter 7); Industrial Skill Standards (Volume III, Chapter 3); Vocational Education Serving Native Americans (Volume IV, Chapter 3); Vocational Education in Correctional Facilities (Volume IV, Chapter 4); Minority Participation in Vocational Student Organizations (Volume IV, Chapter 5); and Coordinating Vocational Education and Federal Job-Training Programs (Volume V, Chapter 3).

This volume of the *Final Report* contains a policy statement by the Advisory Panel and the Assessment's summary and recommendations. Authors of these pieces are:

> The Future of Perkins: A Policy Statement by the Independent Advisory Panel — Laurel McFarland
>
> Summary and Recommendations of the National Assessment of Vocational Education — David Boesel

In late June, 1994, a limited number of advance copies of this *Final Report* were published in order to meet the July 1, 1994 Congressional deadline. This second edition contains editorial changes to the advance copies. Some substantive changes were made to Chapter 1 of Volume IV (State and Local Responsibilities Concerning Special Population Students), because of inconsistencies between that chapter and Chapter 1 of Volume V (Allocation and Uses of Perkins Funds). In addition, Chapter 3 of Volume 5 (Coordinating Vocational Education and Federal Job Training Programs) has been reduced in size and rewritten to improve readability.

While conducted within OERI, this assessment is an independent study and does not necessarily reflect the views of OERI or the U.S. Department of Education.

David Boesel
Director, National Assessment
of Vocational Education

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The National Assessment of Vocational Education has been developed and administered by the following staff members of the Office of Research, Office of Educational Research and Improvement:

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Beverly Farrar
Debra Hollinger
Lisa Hudson
Charles Masten
Ron Myers
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Duc-le To

The National Assessment staff were assisted in this task by a great many people in a number of organizations. There are too many people to thank individually, but our gratitude for a job well done extends to all involved, in addition to those acknowledged below.

First, this report would not have been possible without the unwavering support of Joseph Conaty, Acting Director of the Office of Research; Sharon Robinson, Assistant Secretary for the Office of Educational Research and Improvement; Diane Ravitch and Christopher Cross, former Assistant Secretaries for OERI; and Milton Goldberg, formerly Director of the Office of Research. We are grateful for their trust, encouragement, and professional integrity throughout this challenging study.

Westat, Inc. performed the daunting task of administering and analyzing the Omnibus Survey, the Followup Survey, and the Employer Survey. Westat and MPR Associates also conducted the Community Case Studies, Funding Case Studies, and Tribal Case Studies. We would particularly like to thank Lance Hodes, Melanie Martindale, Brad Chaney, and Diane Ward of Westat; Gary Hoachlander and Paula Hudis of MPR Associates; and Ann Milne of AMM Associates. We are also grateful to the thousands of education administrators and other school and community personnel who responded to lengthy questionnaires and agreed to participate in site visits; we recognize the imposition these data collection efforts caused for respondents, and appreciate their willingness to share their time and knowledge with us.

The National Assessment included many other surveys as well as analyses of existing databases. For assistance with the National Assessment of Vocational Education Teacher Survey, we would like to thank Judi Carpenter of the National Center for Education Statistics, and Elizabeth Farris and Sheila Heaviside of Westat. For thorough and painstaking analyses of the National Postsecondary Student Aid Study and the 1982, 1987, 1990, and 1992 transcript studies, we thank John Tuma of MPR Associates; for similar efforts on the Schools and Staffing Survey, we thank Robin Henke of MPR. Our access to and understanding of corrections education data was assisted by Gail Schwartz of the Office of Vocational and Adult Education, Diane Pelavin and Daniel Sherman of Pelavin Associates, and Alice Tracy of the Correctional Education Association. The Survey of Vocational Student Organizations was ably conducted and analyzed by Fumiyo Tao and George Richard of Fu Associates.

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Along the way, numerous people helped us to remain on target, on time, and of sound mind. For this we thank Daniel Chenok and Cynthia Brown of the Office of Management and Budget; Donald Brannon and Barbara Shay of the Council of Chief State School Officers; Joseph Cassello, Tom Corwin, and Tom Johns of the U.S. Department of Education; Gary Hoachlander of MPR; Madeleine Hemmings of the NASDVTE; and Anne App of Word for Word, the Advisory Panel's diligent recorder. We are particularly grateful to the Advisory Panel (see separate listing) for their constructive comments, recommendations, and assistance throughout the three years of the study.

The text and structure of the *Final Report* were enhanced by the review and comments of the National Assessment's Advisory Panel and the following OERI staff: Nabeel Alsalam, Mary Frase, and Jim Houser of NCES, and Judith Anderson, Marilyn Binkley, Joseph Conaty, Jim Fox, Sue Klein, Patricia Lines, Sheilah Maramack, and Nevzer Stacy of OR. Two organizations, Conwal Incorporated and HumRRO, provided courteous and professional production assistance under the pressure of inflexible deadlines. We would especially like to thank Pearl NaChampassak, Shelia Newman, and Janet Pooley of Conwal; Mazie Knerr of HumRRO; and our editor Lola Zook for their patience, perseverance, and good work.

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THE FUTURE OF PERKINS: A POLICY STATEMENT

by the

Independent Advisory Panel, National Assessment of Vocational Education

Stop! Before Congress reauthorizes the Perkins Vocational Education Act[1] in 1995, they need to consider the critical role of vocational education in today's economy and society.

Vocational education is not a dinosaur — at least not in its reformed, reinvigorated state. Technical and occupational skills are critical to building a high-skill, high-wage American workforce. Individuals with vocational training (especially at the postsecondary level) who obtain related jobs enjoy higher wages than their peers with a general education. On a broader scale, many of the firms that have used highly skilled workers to transform their enterprise to a high-performance work organization have benefited on their bottom line. A desire to meet word-class levels of productivity and competitiveness should propel us toward **better** vocational education, not less. The definition of vocational education may need to change, to embrace an integrated mixture of cognitive, industry-related, and occupationally specific skills, but vocational education will remain a vital part of this nation's preparation of individuals for work.

To adjust to the changing economy, vocational education needs to change radically in the next decade. While some reform has already taken place, a significant amount of vocational education, particularly secondary vocational education, has failed to respond to the emerging skill needs of employers. The federal government can help leverage change by creating a new Perkins Act. The Perkins Act is the federal government's principal instrument for improving the quality of vocational education in America. The next Perkins Act should develop these three principles:

- First and foremost, vocational education should become an integral part of a reformed American **system** of education and training. A comprehensive system should provide all students with access, multiple entry and exit points, clear education pathways, quality programs, high standards, information, and linkage to the labor market.

- Vocational education should be **high quality**: It should be competency-based, with industry involvement. **Industry-oriented skill standards**[2] should be used as the mechanism for connecting vocational education to the larger system of education and training. In combination with academic and employability skills, skill standards will provide all students with a rigorous preparation for work and life.

- Vocational education should be accessible to **all students**: The federal government has a vital and continuing role in securing quality vocational education for **disadvantaged**, **limited English proficient**, and **other special population** students who want to pursue that path of study.

In 1990, the 1984 Carl D. Perkins Vocational Education Act was reauthorized, with major changes to encourage higher performance standards, equal access, and new programs for delivering vocational education. For the past three years, the National Assessment of Vocational Education has examined the impact of federal aid to vocational education, and it has now issued its final report. The National Assessment findings are important, and raise serious, troubling questions about the federal government's present approach to vocational education, and about its commitment to preparation of a quality workforce.

As the Independent Advisory Panel to the Assessment, we seek to amplify the findings of its research report, and to draw on our collective experience over the past three years to make policy recommendations to Congress about the future of Perkins.

We advocate that the new Perkins Act break with the past. While many of the goals of the 1990 Act were set in the right direction, the results have been disappointing in many areas. We recommend a major change in the nature of the federal government's involvement in vocational education. We propose a radical new role for the federal government in supporting vocational education: fostering a truly comprehensive **system** of preparation for work.

One of the keys to the establishment of a system will be the introduction of **industry-oriented skill standards**. These standards will be important for raising the status and content of vocational education, but they will also give form and content to education in general, and contribute to the creation of a system of education and training. Moreover, the standards will serve the existing Perkins commitments to "special populations" and program improvement by helping to improve the rigor and accountability of all vocational education programs, for **all students.**

Perkins and Vocational Education Must Become Part of a New System

Unlike many other industrialized nations, this country still lacks a comprehensive system of workforce preparation. Educational programs and institutions operate in loosely coordinated, sometimes disconnected ways, and individuals are left on their own to navigate their way through them and into the labor market. The Perkins Act will be reauthorized at a time when the reform of other aspects of American education is well underway. A growing consensus has emerged, both in local communities and among policy makers, concerning what an American system of workforce preparation should look like. The key elements include standards (academic and industry-linked), assessment, credentialing, curriculum frameworks, teacher training, labor market information, and planned pathways.

All federal education and training legislation, including the Perkins reauthorization, should complement and strengthen this creation of a system. But, despite the Perkins Act's expressed interest in integrating academic and vocational education, the provision of vocational education in many states is still quite isolated from the rest of the education system, and from the rest of educational reform. **Perkins is not well designed to accomplish system-building at present.** The National Assessment report suggests several reasons why:

1) There is still too much emphasis on **services** rather than program improvement. In particular, Perkins does not place sufficient stress on teacher training as the key to program improvement.

2) Perkins provides extra funding for special populations students rather than supporting the attainment of high standards among these populations. Categories and labeling may present barriers to the operation of a seamless system of education and training for all students.

3) By channeling additional funding to local sites, the 1990 Perkins Act overlooks the vital role of state governments in supporting vocational education reform. States represent the most promising way to achieve vocational education reform on the scale necessary to have an impact on workforce quality. By making clear what results it wants from the system, Congress can allow considerable flexibility in the way states design the systems and structures to accomplish these goals.

4) Perkins fails to take into account the different roles of secondary and postsecondary education in workforce preparation. And it is largely silent on what the respective roles of these levels **should** be.

5) Though promoting links with postsecondary education through support of tech prep, Perkins does not give sufficient attention to links with the workplace, such as work experience programs, or to coordination with other training providers, such as the Job Training Partnership Act (JTPA).

It is vital that the next Perkins Act be integrated with the Goals 2000: Educate America Act, particularly with respect to academic and occupational standards. The Perkins Act should also connect with the School-to-Work Opportunities Act, the Adult Education Act, and the Higher Education Act, which is the principal source of government assistance for postsecondary vocational students. In addition, the Perkins Act should complement federal efforts to aid the disadvantaged: JTPA, the JOBS program, and future welfare reform legislation. Finally, the Act should dovetail with the Re-Employment Act[3] and its emphasis on improving information, about both training options and labor market prospects. The Perkins Act should complement, not contradict the other legislation, and it should take the lead in emphasizing the importance of a mixture of cognitive and vocational skills in the preparation of individuals for work.

If these laws can all be connected to each other in a more seamless way to foster a system of education and training, then the Perkins Act's present emphasis on **initial**

preparation and **in-school** (or **in-college**) provision of vocational education should be carried further.[4] Perkins should serve as a **foundation** for creating a system of life-long education and training. If Perkins were to implement high standards in the initial preparation of students for work, it would launch this system of lifetime skill acquisition at a high level.

Industry-Based Skill Standards

Introducing skill standards to vocational and technical education will not be an easy road, or even a path of guaranteed success. On one hand, by providing an **external** standard and industry input into curriculum content, skill standards may introduce a new force to improve the rigor, status, and market relevance of vocational education. On the other hand, skill standards may be defined too narrowly, assessments may not be able to measure the skills that employers actually value economically, and skill-based credentials may discourage private investment in training by employers because workers' skills will be more documented, and hence more portable.[5] They may also establish standards-setting mechanisms that are not flexible or adaptive to rapid changes in employers' skill requirements.

Skill standards have been established in limited occupational or geographic areas in this country, and new efforts are underway to establish standards and credentials in certain industries.[6] But thus far, no national framework for standards has been developed, and many of the existing standards are haphazard, or focused on narrow entry-level skills. The evidence on the effectiveness of skill standards is still limited and preliminary. This National Assessment report provides evidence on the international experience with skill standards and the limited American experience with skill standards in certain occupations and industries. It concludes with a cautious but optimistic recommendation that explicit industry-based skill standards should become part of vocational education.

The Advisory Panel to the National Assessment of Vocational Education believes that industry-oriented skill standards should be introduced and integrated into the provision of vocational education in America. Skill standards are a promising development, and should be pursued aggressively, but responsibly. The next reauthorization of Perkins should support this effort through financial and practical support of the standards-setting process, but also through the initiation of research on the economic impact of industry-based skill standards in practice. Skill standards should be introduced only if they improve the quality of the workforce and the functioning of the labor market.

Though the skill standards-setting process will have to be employer-driven, the federal government will have a vital, counterbalancing role to play. Because employers' interests rest in their own needs for producing efficiently, the federal government look out for the interests of students in a system of skill standards and credentials. It should promote equal opportunity in access, portability of skill credentials, and the presence of general and foundation skills in the standards (rather than just occupationally specific skills). The federal government will also have a critical role to play in coordinating and funding the standard-setting process,

in order to prevent a market failure caused by employers lacking sufficient individual interest to develop standards on their own.

Perkins should become the principal vehicle for connecting skill standards and vocational education, and thereby contribute to a comprehensive system of workforce preparation in America. The next Perkins Act should recognize that responsibility in its language. It should be the champion of closer connections between standards-setting in occupational and academic areas, and it should encourage localities to recast vocational education as an integrated mixture of cognitive, industry-related, and occupationally specific skills.[7] The new Act should also support schools and colleges in their efforts to reconcile their curriculum frameworks with these standards.

Special Populations: Meet the Standards

The Advisory Panel believes that the last Perkins Act may have both harmed and helped the special populations it tried to serve. (These groups include students who are disabled, educationally or economically disadvantaged, or of limited English proficiency.) Special funding formulas for special populations can be harmful if they encourage schools to retain students in those categories because funding depends on it. The 1990 Perkins Act did move in the right direction by replacing categorical, set-aside funding with general funding formulas weighted to reflect the presence of special populations. But the Act still demands assurance that funds are being spent on supplemental services for special populations, rather than pressing educational institutions to demonstrate that they serve these populations well by emphasizing **performance**. The Perkins Act should encourage the movement of students out of the special populations categories (where appropriate), as well as high standards, high program completion rates, and labor market success among special populations. In short, Perkins should establish a new criterion for judging state and local effectiveness in serving special populations: Did the expenditures serve the best educational interests of the individual student, by improving his or her attainment of the standards?

And as vocational education is put into the larger context of school-to-work programs supported by the new School-to-Work Opportunities Act, the federal government's concern for special populations should also be expanded. The federal government has an important interest in ensuring that disadvantaged and disabled students have access, not just to high-quality vocational education, but also to work-based learning opportunities and job placements. The National Assessment has found that many of the newer structured work-based programs are quite small and frail, because of the shallow or limited involvement of area employers, so over-regulation at this point could be quite damaging. Nonetheless, work experience can provide a valuable complement to in-school education, and the federal government should remain a strong advocate of access for special populations to programs that provide such experience.

With the advent of industry-oriented skill standards, the federal government's concern with special populations should shift to bringing those students up to the standards. That shift to achievement of standards by special populations should be

supported in Perkins by increased allocations for improving the quality of programs. This emphasis will force government and educational institutions to return the emphasis in vocational education to the right place: **to the student's *individual* needs in achieving the standard, not to their assumed needs as a member of a particular "special population" group**. He or she may need more time, more personal effort, or more individual help. The allocation of resources should reflect these individual needs in the achievement of the standard.

Conclusion: The Federal Role in Vocational Education

Though the National Assessment demonstrates that the contribution of vocational education to individuals' educational and economic outcomes has been somewhat disappointing (especially at the secondary level), **the federal commitment to vocational education should not be reduced or abolished.** Vocational education remains a vital piece of this nation's efforts to create a high quality workforce and avenues for school-to-work transition.

Rather, the federal interest in vocational education should be recast as a foundation stone of a new American system of education and training for work. The system should be competency-based and include clear pathways for students, assessment, credentialing, curriculum frameworks, teacher training, and effective career counseling and labor market information. Industry-oriented skill standards should be the principal vehicle for tying vocational education to this larger system of education and training. Though further research is necessary, such standards hold considerable promise in improving the quality of the technical and occupational workforce.

The next Perkins Act should capture this new federal role in vocational education by:

- Continuing the **shift** of emphasis in Perkins from funding **services** to **program improvement.** The last Perkins Act did increase support for program improvements, such as tech prep, and the integration of academic and vocational education. These reforms are vital to the future of vocational education. This emphasis on program improvement should be continued in the next Act, and be expanded to include support of **teacher training.** Special funding for services to special populations should be de-emphasized, in favor of improving programs that will assist those individuals in meeting skill standards.

- Once again emphasizing the **state role** in vocational education reform. States should have considerable flexibility in designing the systems and structures to accomplish federal goals and desired outcomes — but they should be held to making these reforms. States hold the key to achieving vocational education reform at a pace and scale sufficient to affect national workforce quality.

- Designating Perkins funds to support the financing and institutionalization of broad **industry-oriented skill standards.** Special support should be

made available for the task of integrating these standards in vocational education curricula in high schools and community colleges.

- Holding institutions and states **accountable** for disadvantaged and special populations meeting these skill standards. Their achievement of these standards will be a better way of assisting these populations than simply providing additional funding for services.

A new Perkins Act, that embodies the recommendations the Advisory Panel outlined above, will not only support the creation of a comprehensive system of education and training, but it will also place vocational education in the vanguard of education and training reform in general. By stressing competency measures and emphasizing the introduction of industry-oriented skill standards in vocational education curricula, the Perkins Act can provide important national leadership to the vocational education community. Vocational education remains a critical part of the school-to-work transition, and of workforce preparation in general, and a new Perkins Act will create an effective new federal role.

This statement represents the opinions of the Independent Advisory Panel to the National Assessment of Vocational Education, and does not necessarily reflect the position of the U.S. Department of Education, or the National Assessment of Vocational Education.

ENDNOTES

1 The 1990 Perkins Act was formally entitled "The Carl D. Perkins Vocational Education and Applied Technology Act of 1990."

2 Throughout this statement "Industry" is used in its widest sense, to include not just the manufacturing sector, but also the service sector, health, business, the non-profit sector, and so on. "Industry-oriented" is used rather than "Industry-based" to reflect the Advisory Panel's belief that industry-based skill standards may be too narrow a concept: Students should be encouraged to develop a broad range of generic abilities that translate into a number of occupations.

3 This Act had not yet passed in June 1994.

4 In this statement, the term "initial preparation" refers to the education and training that a young person obtains before permanently entering the workforce. This may include postsecondary education.

5 See Robert Triest, "Occupational Credentialing: A Review of the Empirical Evidence," Preliminary Draft, Department of Economics, University of California, Davis, February 1994; and James Heckman, Rebecca Roselius, and Jeffrey Smith, "U.S. Education and Training Policy: A Re-evaluation of the Underlying Assumptions Behind the 'New Consensus'," Center for Program Evaluation, Working Paper CSE94-1, pp. 22-24.

6 For a detailed discussion of the state of skill standards development in the United States and abroad, see Joan Wills. The Institute for Educational Leadership, *Overview of Education and Industry Skill Standards Systems in the United States and Other Countries*, Volume 1, 1993. For a discussion of the potential benefits and problems of introducing industry-based skill standards, see Chapter 3 in Volume III of this report.

7 "Employability skills," the practical skills that individuals need to obtain and keep jobs, are also frequently cited as desirable additions to a fully integrated vocational education curriculum.

SUMMARY AND RECOMMENDATIONS OF THE NATIONAL ASSESSMENT OF VOCATIONAL EDUCATION

I. INTRODUCTION

The Economic Context

Over the last two decades, several major changes in America's economy have altered the skill requirements of the workforce and have focused attention on the way American education prepares young people for work. These changes include the emergence of a global economy, the development of new forms of organization in the workplace, and the continuing growth of technology.

The emergence of the global economy brought with it a decline in America's international competitiveness. For more than 20 years after World War II, the United States faced only limited foreign competition, in part because the war had weakened many economically developed nations and in part because many other countries, or colonies, were underdeveloped. However, the recovery of industrialized European and Asian nations, together with the decolonization and economic development of others, greatly intensified the competition. By the 1970s America's share of the world market had begun to shrink, and its relative economic position continued to decline through the 1980s. Although there have been recent improvements in some sectors of the economy, the nation's competitiveness remains an issue of critical importance.

Our competitors include high-skill manufacturing economies with well-educated workforces, often employing new technology and new forms of work organization to produce high-quality products. Japan's export-oriented manufacturing sector is an example of this kind of economy. Our competitors also include nations with less well educated but disciplined workforces able to perform the sort of semi-skilled work that has been the backbone of American manufacturing, and willing to do so for lower wages. Thus, many American manufacturing jobs have migrated to countries such as Taiwan, Korea, and Mexico. One major report has observed that if America is to avoid competing primarily with low-wage labor in other countries, we will have to invest more in educating and training America's workforce to compete better with the high-skill economies.[1]

Increased competition, both foreign and domestic, is leading American companies to adopt new forms of work organization, the second factor affecting the skills required of the workforce. The traditional organization of work in fields such as manufacturing has been based on extensive division of labor, narrow specialization, routine repetition of tasks, and authoritative top-down management. This system casts the worker as a cog in a machine, and it requires

reliable, responsible behavior more than thinking skills and flexibility from front-line workers. Management is primarily responsible for supervision, decision-making, and leadership.

This organizational model worked well through the 1960s, but by the 1970s it was becoming clear that a new model developed in Japan could often achieve higher levels of productivity, quality, and customer satisfaction. Following the principles of W. Edwards Deming, the new system makes much greater use of the skills and abilities of front-line workers. It eliminates layers of management and assigns front-line workers more responsibility for supervisory functions such as improving operations, solving problems, and assuring quality control. Teamwork and job rotation are often key elements in the new model. Customer needs infuse and help guide the process.

This system requires more active thinking, communication, and collaboration among workers than the old one; hence it requires better educated, more flexible, and more socially adept workers. While the high-performance workplace is not yet the dominant mode of production and service delivery in this country, its recent growth can be gauged from estimates of its prevalence. In the late 1980s only 5 percent of employers were estimated to have restructured their workplaces along these lines. By 1993, around one-third of all establishments were estimated to be incorporating major components of the high-performance workplace. (This estimate, from survey data, is tentative and requires on-site verification.) Large manufacturing firms were the most likely to be adopting these new forms of work organization.

The third factor that has altered the skills demanded of workers is technological change. While improvements in technology are an old story, today's technology is becoming ever more pervasive and sophisticated. Particularly dramatic has been the proliferation of computers and telecommunications equipment. Many industries have been transformed by the infusion of computer technology into their production and services.

The use of computer assisted design (CAD) technology is estimated to have increased productivity in drafting at least six-fold in comparison to traditional methods. The insurance industry now routinely uses computerized underwriting software. Auto mechanics use computerized diagnostic equipment. In agriculture, computers assist with herd management, crop rotation, and pest control. In many businesses and offices, of course, computers are now essential for word processing, financial management, sales information, and a wide range of other applications.

Some 36 percent of workers used computers on the job in 1989, and occupations requiring computer literacy have been among the fastest growing in the last several decades. There is also evidence that employees with computer skills earn higher wages than similar employees who lack such skills.

Computers have increased the skill levels needed in some jobs and reduced them in others. Their net effect on skill requirements is still a matter of debate. Whatever their level, though, computer skills are in demand, and there is every reason to expect the demand to increase.

The emergence of a global economy, the creation of high-performance workplaces, and technological growth have contributed to demand for higher skill levels and different kinds of skills. There has been debate over the rate of upskilling in the economy in the last two decades and the rate expected in the future. While it seems clear that there has been no explosion in the demand for skills in the workforce as a whole, the demand for professional and technical skills is growing fast, and the overall demand for skills is growing at least at a moderate pace. This suggests that there will be increased demand for workers with postsecondary education, which already confers substantial earnings benefits.

The results of these trends are evident in data on earnings. In the 1980s the earnings of college graduates increased 10 percent, those of high school graduates fell 9 percent, and those of high school dropouts decreased by 12 percent.[2] The disadvantaged and minorities were especially hard-hit by the changing requirements of the labor market. College graduates, who could move into professional, managerial, and technical jobs, did relatively well in this period, but high school graduates, who earlier could find relatively stable, well-paying manufacturing jobs, increasingly tended to move from one low-paying job to another, often in the service sector, as manufacturing jobs disappeared. Those without high school diplomas increasingly moved to the margins of the economy.

Education's Role

In the context of these economic changes, the poor performance of American students on international achievement tests and complaints from business and military leaders about the lack of basic skills among high school graduates focused the spotlight on our system of public education. A nascent movement for reform gained momentum with the 1983 publication of the Commission on Excellence in Education's report, entitled *A Nation at Risk*.[3] The report emphasized higher standards for education and more rigorous academics for elementary and secondary students.

State governments responded quickly to this call, raising requirements for high school graduation and admission to state colleges and universities. Soon thereafter, other educators charged that the new reforms tended to focus on college-bound students and to ignore the majority of secondary students who do not attain baccalaureate degrees. They called for structural reforms to improve the way the education system prepares secondary and non-baccalaureate

postsecondary students for work. The 1990 Carl D. Perkins Act embodies many of these reforms.

The Perkins Act

Successor to the 1984 Perkins Act, the new Act seeks to strengthen the academic and technical skills of students in vocational education by a) requiring the development of statewide vocational performance standards and measures; b) integrating academic and vocational curricula; c) promoting two-plus-two tech-prep programs that link high schools with postsecondary institutions; and d) supporting work experience programs, such as apprenticeships and cooperative education.

The Act focuses particularly on improving the occupational education of those hit hardest by declining wages in low-skill jobs. Termed "special population students," they include the economically and educationally disadvantaged, the disabled, the limited-English-proficient (LEP), individuals in programs designed to eliminate sex bias, and individuals in correctional institutions. The Act's dual emphasis on program improvement and special populations has been a key feature of federal assistance to vocational education for over two decades, and it parallels the Department of Education's twin goals of excellence and equity in education.

The National Assessment of Vocational Education

In order to evaluate the Perkins initiatives and to provide information for the next round of legislation in the mid-1990s, the Act calls upon the Department of Education's Office of Educational Research and Improvement (OERI) to conduct a National Assessment of Vocational Education. The Assessment is required to address a series of issues related to participation in secondary and postsecondary vocational education; the academic and employment outcomes of vocational programs; the Perkins reforms; access and services for special population students; and Perkins funding and administration.

In response to this mandate, OERI has collected information and conducted analyses over a period of more than three years. An *Interim Report* of the National Assessment, containing our preliminary findings, was completed in December 1993. This *Final Report* updates the preliminary report, incorporating the findings of new surveys, case studies, and literature reviews. In addition to revisions of previous chapters, the new report contains seven new chapters on the following subjects:

- Educational outcomes of vocational education
- Employer involvement in, and satisfaction with, vocational education
- Industry skill standards

- Vocational education in tribal institutions
- Vocational education in correctional facilities
- Minority student participation in vocational student organizations
- The coordination of Perkins, JTPA, and other federal job training programs

This summary has three parts. The first briefly discusses the condition of vocational education in secondary schools and non-baccalaureate postsecondary institutions. The second addresses questions posed in the Perkins mandate and issues related to those questions. It also makes recommendations based on the evidence in the report. The third discusses some implications of our findings and suggests a model of occupational education consistent with them.

II. OBSERVATIONS ON THE CONDITION OF VOCATIONAL EDUCATION

Secondary Vocational Education

Background: Most secondary vocational education occurs in vocational programs in comprehensive high schools. Some is provided in area vocational schools, where students typically spend half a day on vocational courses, followed or preceded by half a day in their comprehensive high schools. Area vocational schools are more likely to be located in suburban than in urban or rural areas. A small number of students attend all-day vocational high schools, which are typically located in urban areas and which focus on vocational education, while providing essential academic courses.

Almost every high school student earns at least some credits in vocational education courses, but only one in four graduates as a vocational student — that is, earns at least three credits within in one vocational program area. Among the 24 percent of students who do concentrate their vocational coursetaking, business and the trades (such as carpentry, metal working, and welding) are by far the most popular program areas.

Secondary vocational districts receive more Perkins money than regular districts, on average. They also tend to receive more support and assistance from state vocational education agencies and to be more active in implementing Perkins reforms such as integration and tech prep. Perkins basic grant funds are associated with greater reform efforts at the local level, as are state support for Perkins reforms and the perceived influence of the Perkins Act.

Student Participation: Over the last decade there has been a broad shift away from secondary vocational education and toward academics. After a period of growth in the 1960s and 1970s, secondary vocational education has been shrinking. Students are taking fewer vocational courses than in the early 1980s; there are fewer vocational teachers and fewer university programs training them;

and fewer state employees work in vocational education. We do not know how much increased academic requirements for graduation have contributed to decreasing vocational enrollments, but it is clear that factors other than these requirements are involved, as the decline started before the academic reforms occurred. The fact that the largest decreases are found in business programs and the trades suggests that demand in the labor market may play a role, because clerical and manufacturing jobs employ a declining share of the workforce.

As vocational enrollments decrease, their composition is changing. Special population students are an increasing proportion of all vocational students, and higher achieving students are a decreasing proportion. The Perkins emphasis on recruiting special population students to vocational education may be among the factors contributing to this tendency.

On average, the change in student composition is occurring slowly, but it is considerably more evident in vocational schools than in regular high schools. In some places, area vocational schools have become largely institutions for special needs students. Vocational teachers and administrators are worried about this trend and about the status of vocational programs in the larger education system. Our case studies show evidence of stigmatization where large numbers of special population students are concentrated in vocational programs. These studies suggest that there may be a "tipping point" after which other students avoid vocational programs.

A closely related issue is the "dumping" of problem students into vocational education programs, a practice often encountered in our case study sites. We do not know how widespread the practice is, but 55 percent of vocational teachers in our national survey say that the placement of problem students in vocational programs regardless of appropriateness is a serious problem. Of 13 potential problems listed in the survey, this is the one most often regarded as serious.

The fundamental question in placing students in vocational programs (or any others) is whether the interests of the students are well served. This is a complicated question. Vocational coursetaking probably reduces dropout rates, enabling some students who would otherwise leave school to graduate. However, if dropout rates are low because courses are easy, the interests of students who are not prone to drop out may be adversely affected. In a similar vein, disabled students receive earnings benefits from vocational coursetaking, but there is little evidence of benefits to economically disadvantaged or limited-English-proficient students (except that some may gain by staying in school rather than dropping out).

There are two major risks in broad-brush efforts to include more special population students in vocational education. The first is that factors other than the students' best interests will become more prominent in placement decisions. For example, recruiting special needs students in order to keep vocational

enrollments up, and thus maintain staff positions, is a familiar practice, and it often complements a desire in comprehensive schools to move hard-to-educate students out of regular classes. In situations such as this, some students will benefit from participation in vocational programs, but others will not.

The second risk is that vocational programs, especially those in area schools, will increasingly become special needs programs separated from the mainstream of secondary education — an outcome opposite to the integration of academic and vocational curricula envisioned by Perkins.

Program Quality and Program Improvement: The *Interim Report* found significant weaknesses in the quality of secondary vocational programs, including deficits in the formal education of teachers, insufficient homework in vocational courses, and inadequate requirements for vocational program completion.

Since the publication of that report, new information also highlights some strengths not previously observed. A new survey reveals that employers familiar with secondary vocational programs have high opinions of them. And, while the *Interim Report* noted mixed findings on whether vocational programs help reduce dropout rates, new data and additional analyses now strongly suggest that they do. In addition, vocational programs are the major providers of computer training in secondary schools, mainly in business and technical programs, and computer literacy commands an earnings premium. Also, advanced vocational courses seem to provide more contextualized academics than other courses.

With regard to program improvement, the Perkins strategy of stimulating reform at the local level seems to have resulted in initiatives of widely varying quality, size, and kind. Efforts represented as reforms include everything from relabeling and ad hoc changes to well planned restructuring efforts.

Many districts are engaged in some form of activity to integrate their curricula and develop tech-prep programs, and there was a notable increase in such efforts between 1992 and 1993. Nevertheless, in most cases the efforts are still new and small, typically involving only a few courses. There is resistance to integration, and definitions of tech prep vary widely. Most school systems are trying to fit the Perkins reforms into their existing curricula, rather than making broad curricular changes. Whether these small efforts will prove to be the beginnings of larger reforms or long-term adaptations to the status quo is yet to be seen.

One factor that may be decisive in the outcome of reform efforts is state leadership. We know that state reform efforts are associated with increased reform activity at the local level, and some states, such as Oregon, Maine, and Tennessee, have adopted comprehensive reforms of work-related education as a matter of policy. While these efforts are still new, and their prospects over the

long term are not yet clear, the state-led reform process seems a promising approach.

Economic Outcomes: Vocational coursetaking at the secondary level pays off for some students, but not for others. The key to improved outcomes is finding a training-related job, but fewer than half of secondary vocational students do so. Rates of matching between training and jobs vary by occupational field. For example, in one analysis, women in the health field used 71 percent of their vocational courses on the job, while men in precision production used 36 percent of their courses. Despite these variable employment outcomes, employers familiar with secondary vocational programs give them high ratings.

Academic courses have small positive effects on wages and employment status after high school, with the effect on wages increasing over time. **Tested competencies**, both academic and vocational, are consistently related to measures of occupational success such as wages and performance on the job, suggesting that competency assessment should be a key feature of program evaluation. General cognitive ability, as reflected in high scores across different tests, is especially versatile, predicting performance across a wide range of occupations.

Reforming the System: Career preparation is a desirable goal for many secondary students, but at present vocational education is too narrowly defined and too narrowly based to achieve that goal. Occupation-specific skill training at the secondary level can be valuable, but it focuses on jobs rather than careers, and its value is qualified by relatively low rates of vocational skill use on the job. Secondary education systems need to expand the scope of occupational curricula to broader subject areas, focusing on industries rather than occupations, for example, and using applications to teach underlying principles (e.g., deriving power from the expansion of gasses) rather than simply to teach occupational procedures (e.g., how to replace pistons). Secondary educators should make this kind of education broadly inclusive, encompassing a large part of the secondary student body, focusing on the development of cognitive skills, and preparing many students for postsecondary education. One way to do this is to eliminate the general track, fold vocational education into a system of industry-based majors, and prepare participating students, as much as possible, for some form of postsecondary education, including both two-year institutions and four-year colleges and universities. The conclusion to this summary provides one model of such a system.

Postsecondary Vocational Education

Background: Most postsecondary vocational (occupational/technical) education is provided in community colleges. Private proprietary schools are the second largest providers, followed by public technical institutes and area vocational schools serving postsecondary students. Because almost all Perkins funds go to

public institutions, the assessment focuses on them, rather than on private institutions. The largest providers, community colleges, serve students in a wide range of ages who attend for a variety of purposes. Only a minority of students enter community colleges directly after high school, and many enrollees do not receive associate's degrees or certificates.

While secondary vocational districts are more likely than regular districts to receive Perkins funds and be involved in Perkins reforms, the situation is different at the postsecondary level. It is the comprehensive postsecondary institutions — the community colleges — that are the most likely to receive Perkins funds, to have integrated curricula, and especially to develop tech-prep programs.

In contrast to the pattern in secondary districts, the allocation of Perkins basic grants across postsecondary institutions is not strongly associated with integration and tech-prep efforts. Basic grants seem to be less a stimulus to reform at this level. Moreover, state postsecondary agencies have less influence than secondary agencies over their local institutions and hence have less potential as agents of reform.

Student Participation: Vocational education is a relatively large and stable part of the postsecondary system, accounting for two-thirds of all students in sub-baccalaureate institutions. In the late 1980s, vocational enrollments increased at the same pace as enrollments in general, in spite of rising attendance costs and a declining cohort of college-aged students. Apparently students continue to be attracted to postsecondary education because of its ability to improve job opportunities and pay. Health education, technical education, and occupational home economics (including child care and commercial cooking) are among the areas of fastest growth, perhaps reflecting increased labor market demand for these skills.

While postsecondary vocational programs tend to have more special population students than others, the concentration of special populations in vocational education appears to be stable. Their proportion of all enrollments did not increase from 1986 to 1989 and that of other students did not decrease. "Dumping" and stigmatization are not major issues at the postsecondary level.

Program Quality and Program Improvement: Postsecondary vocational programs provide more structure than their secondary counterparts for students working toward a degree. Occupational majors that include vocational and related academic courses are common. Moreover, postsecondary institutions, especially community colleges, have had elements of curricular integration for some years. These include prerequisites and corequisites that link academic and occupational courses; cross-curricular instruction; interdisciplinary courses; and academic remediation for occupational students. Perhaps because these "traditional" strengths of postsecondary education appear to have worked well,

two-year institutions have generally not been inclined to undertake new approaches to integration in response to the Perkins Act.

Economic Outcomes: The economic outcomes for postsecondary vocational students are better than for secondary students. Postsecondary completers are more likely to find jobs related to their training, and even some coursetaking without completing a program seems to confer labor market benefits. These advantages of postsecondary vocational education are most pronounced for those who attend community colleges.

Employers familiar with postsecondary vocational programs give them high ratings. There is also suggestive evidence that postsecondary vocational programs prepare students for the high-performance workplace better than secondary programs do.

III. PERKINS QUESTIONS AND ISSUES

This part of the summary addresses questions posed in the Perkins mandate to the National Assessment of Vocational Education. It first examines various aspects of program quality in vocational education; then it turns to program improvement, which today has become a drive for comprehensive reform. The section then discusses equity issues related to special populations; and finally it examines funding and administrative issues specified in the legislation.

Each question is addressed by research findings from the main report. Recommendations that flow from the findings are then presented. Many, but not all, of the recommendations are designed to inform the debate over the provisions of the next Perkins Act. Because the Perkins Act may not be the best means of dealing with some issues in vocational education, a few recommendations are addressed to Congress in its role as policymaker in the broader areas of education and labor. Other recommendations are directed toward other education policymakers at the federal, state, and local levels.

A. Program Quality

Conceptually, program quality can be assessed by examining the inputs, processes, and outcomes of vocational education. Among the inputs, the Perkins Act calls for inquiry into the preparation and qualifications of vocational teachers and their academic counterparts. To evaluate process, the report examines vocational programs and courses. The Act also requires an evaluation of the academic and employment outcomes of these programs.

Two qualifications to this approach should be noted. First, a comprehensive evaluation of the quality of vocational education is not required by the Act and is not attempted here. Nevertheless, responses to the questions in the Perkins mandate and related issues do tell us a lot about program quality. Second, the

focus on inputs, processes, and outcomes is not intended as a rigorous model of vocational education; it is merely a convenient way of organizing the findings in this area of inquiry.

Inputs — Vocational Teachers

1. *Teacher Preparation* The Perkins Act mandates an evaluation of the preparation and qualifications of vocational and academic teachers.[4] How well prepared are vocational teachers to provide high-quality education? How well are vocational and academic teachers prepared to teach in the context of comprehensive curricular integration, as envisioned by Perkins? (See Volume II, Chapter 3.)

Findings: Both secondary and postsecondary vocational teachers have less formal education than academic teachers. While virtually all academic teachers and faculty members have at least a bachelor's degree, 12 percent of secondary vocational teachers and 15 percent of postsecondary occupational faculty do not.

While they have less formal education than academic teachers, secondary vocational teachers have more occupational experience related to their subject areas. We infer that the same is true of postsecondary faculty, although data are lacking.

The tendency for vocational teachers to have less formal education and more occupational experience than academic teachers is most pronounced in trade and industrial education (T&I). Forty-five percent of secondary T&I teachers and 33 percent of those in postsecondary institutions have less than a bachelor's degree. Beginning with the 1917 Smith-Hughes Act, which provided the first federal assistance for vocational education, federal law and state certification policies have required less education for T&I teachers than for others, calling for related occupational experience instead. If secondary trade and industrial teachers had the same education as other vocational teachers, the educational differences between vocational and academic teachers at this level would be slight.

Whether extensive occupational experience improves vocational teaching has long been an issue. Research on the subject suggests that several years of occupational experience make a positive contribution to teaching vocational subjects, but that additional years of experience do not. On the other hand, formal postsecondary education is positively associated with desirable teaching and student outcomes. Thus, instruction in trade and industry would benefit if the teachers had more formal education and less occupational experience. More formal education would also facilitate efforts to integrate academic and vocational education.

Judging from secondary vocational teachers' assessments of their ability to teach academic subjects, and from academic teachers' assessments of their ability to

teach occupational subjects, both types of teachers currently have enough knowledge in common to begin integrating their curricula. In the longer run, though, if curricular integration is going to encompass the majority of students, a great deal more cross-curricular knowledge will be needed on both sides.

The Perkins Act also calls for an assessment of "shortages" of vocational teachers. There is no evidence of any national shortage, though there may be shortages in some subjects and/or geographical areas. As secondary vocational enrollments have declined, the number of secondary vocational teachers fell 9 percent between 1987-88 and 1991, while the number of other teachers increased 7 percent. Current projections show no future shortages either, but changes such as state reforms focusing on workforce preparation may increase the demand for vocational teachers over time.

Recommendations: The new Perkins Act should support the preparation of teachers for reformed workforce preparation systems in which integrated learning and the development of cognitive skills, broad technical skills, and understanding of industries are heavily emphasized.

A bachelor's degree with preservice training in education should be a standard requirement for the certification of all new vocational teachers and occupational faculty. A limited amount of relevant occupational experience should also be required or encouraged in most subjects.

Assuming that reformed career preparation systems are developed at the secondary level, new academic teachers will need more of an orientation to the world of work, possibly through courses in business and technology or in methods of teaching academics in a work-related context. New vocational teachers should have more courses and more rigorous courses in the liberal arts (especially math and science) and in computers.

Process in Vocational Education

2. ***Programs and Courses.*** The Perkins Act calls upon grant recipients to improve the quality of vocational education programs by integrating academic and vocational offerings in coherent sequences of courses.[5] To what extent do districts require such sequences for vocational program completion? How demanding are vocational courses as compared to academic courses? With regard to integration, how extensive is the cross-curricular content of vocational and academic courses (e.g., academic content of vocational courses), and how much can the present cross-curricular content contribute to integration? (See Volume II, Chapter 4.)

Findings: In general, secondary vocational programs are not as coherent or rigorous as they should be. They usually lack prerequisites, which maximizes access but reduces chances of aligning vocational courses with each other or with

academic courses. Most districts, including Title II grant recipients, do not meet the Perkins requirement for a coherent sequence of academic and vocational courses. Only about one-third of districts, encompassing one-half of secondary students, require a sequence of **vocational** courses for program completion. However, a slight majority of districts, encompassing almost three-fourths of students, require a concentration of vocational courses in an occupational area (regardless of course level). Such concentration is associated with higher earnings if a training-related job is found.

As a rule, students consider vocational courses more useful but less demanding than academic courses. For example, among students reporting taking specific courses, 58 percent said their business/vocational courses were "very useful"; 53 percent said the same of their English courses; 47 percent, their math courses; and 28 percent, their science courses. In the same survey, 54 percent of students characterized their vocational courses as "very easy," while 31 percent characterized their English courses in that way, and 23-26 percent, their science and math courses. Easy coursework is not necessarily a bad thing; for example, students may find some applied courses "easier" than comparable academic courses, and still learn as much or more. But to the extent that courses do not challenge students to think and question and do not develop cognitive skills, their value is open to question. Another indication that vocational courses are less demanding than academic courses is that the former assign only about 40 percent as much homework, and we know that homework improves performance, at least in academic courses.

Cross-curricular content is of obvious importance in integrating academic and vocational education. Yet vocational courses have only modest academic content, and academic courses have even less occupational content. A little over half of vocational teachers spend at least 10 percent of classtime on academics, while only 18 percent of academic teachers spend that amount of time on occupational subjects. As in the case of teacher preparation, there is probably enough cross-curricular content for the first stages of integration, but much more will be needed if integrated education is to be the principal approach to learning for most secondary students.

Among the areas of strength in secondary vocational education mentioned earlier were contextualized instruction in advanced vocational courses and training in computer skills, which command an earnings premium. Despite this fact, only one-third of all 1992 high school graduates have had at least one semester of instruction in computer use.

Most vocational students, like most other students, do not think they are acquiring the skills they will need for a job five years after graduation. Of those who share this opinion, the largest number think they will need to attend two-year or four-year colleges.

Recommendations: The new Perkins Act should strengthen the requirement for coherent course sequences in funded districts. A sequence of related academic, occupational, and/or integrated courses, moving from more basic to more advanced courses, should be required for program completion and certification in districts that receive Perkins grants. An exception should be made for districts with programs too small to meet this requirement.

Given the positive relation between homework and performance on achievement tests, the relation between time spent on a subject and knowledge of the subject, and the relatively low level of homework assigned in vocational courses, policy makers in vocational education should encourage secondary schools to assign more homework to students in work-related courses.

The new Perkins Act should incorporate the recommendation of the National Commission on Excellence in Education that all high school students be required to complete at least one semester of instruction in the use of computers.

Outcomes of Vocational Education

3. *Educational Outcomes*. The Perkins Act calls for an assessment of the academic outcomes of vocational education.[6] In response to this mandate, the report addresses a number of different questions about academic and other educational outcomes of secondary vocational education. How does vocational coursetaking affect students' achievement? How does it affect their chances of staying in school or dropping out? And how does it affect their chances for postsecondary education? (See Volume II, Chapter 5; also Volume II, Chapter 2.)

Findings: Vocational students (concentrators) earn fewer academic credits than those in the general track, although they are gaining ground. Increased academic requirements for graduation may be responsible for this change. Vocational students also earn fewer advanced academic credits, and their gains have been smaller for these courses.

The test scores of vocational students are about the same as those of general track students, and substantially lower than those of college preparatory students. These differences are largely the result of selection: Students with differing aptitudes and achievement levels enter college preparatory and non-college programs. According to one estimate, 80 percent of the difference between college prep and vocational students is due to pre-existing student characteristics; 10 percent is due to the fact that vocational students take fewer advanced academic courses; and 10 percent is due to other program characteristics.

Consistent with casual observation, the evidence also suggests that vocational coursetaking improves occupational skills, as measured on standardized tests.

Does vocational coursetaking reduce dropout rates? The *Interim Report* found the evidence mixed, with some studies reporting that it does, others that it does not. However, a closer analysis of these studies, taking into account the strength and weaknesses of their methodologies, leads to a different conclusion. The balance of evidence suggests that vocational coursetaking does reduce dropout rates, although a few studies show no effect.

Although a majority of vocational students receive some postsecondary education, they are less likely than college prep students to enroll in four-year colleges and universities, even after personal background, educational aspirations, and other characteristics are controlled. Differences between the two groups are less marked when the outcome is **any form** of postsecondary education, including occupational/technical education. However, some researchers believe that vocational and college prep students cannot reasonably be compared on postsecondary outcomes because they are so different in background and future plans. General track students are a little more likely than vocational students to enroll in postsecondary education, although the differences are trivial. In community colleges, students who were vocational concentrators in high school have lower completion rates than those who were academic students.

Recommendation: Given the economic returns to postsecondary education, the new Perkins Act should emphasize that qualified secondary students in occupational programs should be prepared to attend postsecondary institutions, including (for some) 4-year colleges and universities. This means that, with some exceptions, every high school graduate should be prepared to enter a community college or other two-year postsecondary institution without the need for remediation. The emphasis on cognitive skill development in the model at the end of this volume is central to such preparation.

4. *Employment Outcomes.* The Perkins Act calls for assessment of the employment outcomes of vocational education.[7] Employment outcomes are in many ways the yardstick in evaluating vocational programs. If there is a strong positive relation between vocational coursetaking and employment status, level of occupation, and/or earnings, taking other factors into account, then the student's participation in vocational education, and the public's investment in it, will have been worthwhile. What evidence is there that vocational education pays off? (See Volume II, Chapter 6.)

Economic returns to vocational education at the secondary and postsecondary levels are conditional on a number of factors. The following are associated with better employment and earnings outcomes:

> *Finding a job that matches a field of study.* Vocational students who do so tend to earn more money and have a lower incidence of unemployment than those who do not. After high school, less than half of secondary

graduates are employed in jobs that match their training. Postsecondary students do better, on average: Almost two-thirds of them have training-related employment.

Concentrating coursework in a particular field of study. Students who concentrate their coursework in a vocational field earn more in training-related jobs, are more likely to find training-related jobs, and are less likely to be unemployed than those who do not.

Attaining more years of education. Regardless of the course of study, additional years of education increase wages and earnings. At the secondary level, those who complete high school do better than those who drop out, and vocational coursetaking is associated with reduced dropout rates. At the postsecondary level, there are benefits to additional years of education even if a degree or certificate is not received.

Completing a degree or certificate. There are additional benefits for postsecondary vocational students who earn degrees or certificates; they do better than similar individuals with no postsecondary certification.

Field of study. At the secondary level, those with training in business and health-related fields, mostly women, earn higher wages and experience less unemployment than those in other fields. At the postsecondary level, associate's degrees in health and technical fields tend to improve earnings.

Type of postsecondary institution. Community college students are more likely to be employed and to use their vocational training on the job than trainees from other types of postsecondary institutions.

Gender of the student. Economic outcomes for women with vocational training surpass those for men, probably because their training is more likely to be in occupational fields that pay well. Women with vocational training are more likely than men to improve their wages and earnings, more likely to find a match between training and employment, and more likely to benefit from completing a degree.

Disabled students. Secondary students with disabilities who take vocational education are more likely to be employed than those who do not. Participating in work experience programs increases their likelihood of finding a job, and taking a coherent sequence of vocational courses increases their earnings. Disabled students with vocational training also tend to have better grades and attendance records than others and are slightly less likely to drop out of school.

On the question of whether secondary vocational students do better in the labor market than general track students, the evidence is inconclusive. In many studies

there is no evidence of an overall effect of vocational education, although some studies do report positive effects. Methodological problems often limit conclusions that can be drawn, and the problems are not resolvable without additional information or further data analysis. One thing is clear, however: the research does **not** show that secondary vocational students have a clear, consistent, and sizable labor market advantage over general track students. The debate over whether vocational students do a little better than general students, or about the same, should not obscure the larger fact that, on average, high school graduates with no postsecondary education are doing poorly in the labor market. Without a large difference between the outcomes of vocational and general track students, we must conclude that, for most participants, neither program is working very well.

However, as we have seen, some students do benefit from secondary vocational education. The conclusion to this volume outlines a strategy for reforming both types of education — one that retains vocational programs for those most likely to benefit from them.

For secondary students who do not go on to college, academic courses have small positive effects on wages, employment, and occupational status soon after high school. The effects on wages increase over time. Certain core academic courses — math, science, and foreign language — are the most likely to be related to employment outcomes, as are more advanced academic courses and participation in a college prep program.

Tested skills, both academic and vocational, are consistently related to measures of occupational success such as wages and performance on the job. In the psychological testing literature, general cognitive ability is the strongest predictor of job performance. It is also associated with increased wages and earnings later in one's career (but not in the first job) and with employment status. Broad technical competencies also show substantial positive effects on employment outcomes in one study. A composite of mechanical comprehension, auto and shop information, and electronics scores from the military's ASVAB[8] test is associated with improved job performance, increased earnings, and reduced unemployment. Job-specific skills can also affect earl employment outcomes, but the effect depends largely on a match between training and occupation.

These findings highlight the importance of skills, as distinct from coursetaking, in predicting employment outcomes. This is not surprising. We know that academic and vocational courses improve skills, and we know that skills improve job performance. General cognitive ability and broad technical skills, which include a substantial cognitive component, have substantial effects on employment outcomes. Job-specific skills have smaller additional effects.

At the secondary level, the development of cognitive skills seems to be pivotal, because it helps prepare students both for work and for postsecondary education. Strong cognitive skills also facilitate learning occupation-specific skills, and are the basis of lifelong learning. Broad technical competencies, such as computer literacy or mechanical and electronic knowledge, can help prepare students for a wide range of jobs; and because they include a sizable cognitive component, they can also contribute to college prospects. For most secondary students, training in job-specific procedures should be used primarily as applied learning to improve cognitive and broad technical skills.

Recommendations: The general track in secondary education may be the weakest of the three high school curricula in preparing students for work, and it does not prepare them well for college, either. Hence, the new Perkins Act should encourage states and districts to eliminate the general track and to fold vocational education into a broader system designed to prepare students for careers.

The new Perkins Act should emphasize the development of cognitive skills and broad technical skills in workforce preparation at the secondary level. Training specifically for entry-level jobs should be limited to students for whom the marginal benefits of additional cognitive skill development are relatively low and to programs that offer those students reasonably good chances of finding training-related employment.

Because tested skills are more strongly related to labor market outcomes than coursetaking, education designed to prepare students for careers should be competency based.

Given the payoffs to cognitive skills, broad technical skills, and postsecondary education, much of the training in occupation-specific skills should be deferred to the postsecondary level. (This does not pertain to the use of occupational skills in applied settings to improve cognitive and technical skills.)

Perkins basic grant funds used to support occupationally specific education should be concentrated on programs providing skills for which there is a demand in the labor market. Employment outcome data should be used where possible to identify the kinds of training for which there is a demand.

5. *Employer Involvement and Satisfaction* . The Perkins Act calls for an assessment of employer involvement in, and satisfaction with, vocational education programs.[9] Employer satisfaction with vocational programs is another measure of their quality. How familiar are employers with vocational programs? In what ways are they involved in them? And how satisfied are they with vocational education programs? (See Volume II, Chapter 7.)

Findings: A 1993 survey conducted for the National Assessment asked employers about their familiarity and satisfaction with vocational programs in their local areas. The survey's response rate was 55 percent, and non-response bias may be a problem.

About 60 percent of employers responding to the survey said they were familiar with vocational education programs in their areas. Forty-one percent were familiar with secondary vocational programs and 47 percent, with postsecondary programs. Large employers and those having high-performance workplace components were more likely to be familiar with vocational education than were others.

Half of the employers familiar with vocational programs indicated involvement in one or more activities related to vocational education. For those involved, the most commonly mentioned activities were (a) providing career information to students; (b) actively recruiting and hiring students; and (c) supervising students in co-op or other work-based situations.

Of the 41 percent of employers familiar with secondary vocational programs in their areas, 82 percent reported that the quality of those programs was good, very good, or excellent. Of the 47 percent who were familiar with postsecondary programs, over 90 percent rated the programs good or better. There was no significant variation by size of establishment, but those in the trades, such as auto repair and construction, gave especially high ratings to postsecondary programs. The high-performance establishments were less likely than traditional employers to give good ratings to secondary vocational programs, though there was no difference in their ratings of postsecondary programs. This suggests that postsecondary vocational programs do a better job of preparing students for the high-performance workplace than do secondary programs.

A survey of employers participating in secondary work experience programs also gave these programs high ratings. However, other survey and focus group studies show that employers' opinions of **high school graduates** as young workers are very negative. It seems that employers who are knowledgeable about secondary vocational and work experience programs like them, while employers who are not familiar with them have negative views of the work-related abilities and attitudes of high school graduates and youth in general. This does not necessarily mean that if employers in general knew more about work experience programs, they would regard them favorably. Employers who participate in these programs may have been favorably disposed toward them before participating, and participants dissatisfied with the programs would tend to discontinue their involvement.

Recommendations: The new Perkins Act should encourage business interest and involvement in occupational education. One way to do this would be to support business-labor-education partnerships for training, which are currently

authorized, but not funded. The Act should encourage the development, on a demonstration basis, of partnerships capable of including relatively large numbers of students.

B. Program Improvement: Education Reform

Evidence of America's declining economic competitiveness, together with the poor educational performance and low earnings of high school graduates, generated education reform movements in the 1980s. Initially, reform efforts focused on improving academics in elementary and secondary schools, but in the mid-1980s greater attention was also given to preparing secondary students for work. Prominent among these reforms was an increased emphasis on performance standards and on three structural changes — the integration of academic and vocational curricula, the development of tech-prep programs, and the promotion of work experience programs — regarded as principal components of the school-to-work transition.

6. *Effects of Education Reform.* The Perkins Act calls for an assessment of the effects of education reform on vocational education.[10] Have the reform movements of the 1980s affected vocational education, and if so, how? The Perkins mandate also calls for an assessment of the effects of the Act on local practices, including the capacity of local vocational education systems to address the priorities of the Act.[11] Is there evidence that Perkins is changing vocational education at the local level? What role do the states play in local education reform? (In Volume III, see Chapters 1,2,4 and 5. In Volume IV, see Chapters 1 and 2. In Volume V, see Chapter 2.)

Findings: Education reform since 1980 has occurred in two waves. The first emphasized increased academic work and higher standards. The second wave proceeded from a belief that the first did not adequately address the educational needs of non-college-bound students, and put forth a number of proposals for restructuring education. Among these proposals, the school-to-work transition reforms are of primary interest here.

Both first- and second-wave reforms are incorporated in the Perkins Act. The Perkins requirement that states develop performance standards and measures is a part of the first wave, extended to vocational education. The Perkins emphasis on integration, tech prep, and (less explicitly) work experience programs is part of the second wave.

The impact of first-wave academic reforms on secondary vocational enrollments has been a much debated issue. It is the view of most vocational educators that increased academic requirements for high school graduation, one of the key elements of first-wave reform, have reduced vocational enrollments by leaving students less time for electives, such as courses in vocational education.

Our statistical analyses do not support this view. According to survey reports, between 1987 and 1992 districts with higher graduation requirements showed no greater decline in vocational enrollments than other districts. In our community case studies, on the other hand, it was the nearly unanimous opinion of respondents asked about this issue that academic reforms had reduced vocational enrollments.

The role of higher graduation requirements in decreasing vocational enrollments is still unclear, but the fact that the enrollment decline started before the academic reform movement indicates that factors other than academic reforms are involved. One such factor may be shifts in labor market demand for traditional vocational skills, as the share of clerical and blue collar jobs in the workforce declines.

Some second-wave reform efforts are associated with **increasing** vocational enrollments. Districts that take more steps to integrate their curricula and districts that have more state support for integration than others tend to have increasing enrollments. Districts that have added vocational student organizations (VSOs) and those that have added career exploration courses are also more likely than others to have experienced increases in vocational enrollments. We do not know that these reforms or improvements cause an increase in enrollments, only that they are associated with it.

Second-wave reforms are bringing new energy to efforts to prepare young people for work. At the federal level, the Perkins Act and the School-to-Work Opportunities Act focus on reforms such as integration, tech prep, and work experience programs. The Goals 2000: Educate America Act has created a national board to develop skill standards. At the same time, at least 20 states are considering or undertaking major structural reforms to improve workforce preparation in secondary schools. Among the most active are Oregon, Wisconsin, Maine, South Carolina, Washington, Tennessee, California, Vermont, and Florida.

The data suggest that the Perkins Act has an impact on local programs. School districts receiving Perkins basic grant funds (a) have taken more steps to integrate their curricula; (b) have taken more steps to develop tech-prep programs; and (c) provide more services for special populations than their unfunded counterparts. In multivariate analyses, school districts that report having been influenced by Perkins are more active than others in integrating their curricula and developing tech-prep programs.

Relationships between Perkins funding and reforms such as integration and tech prep are less pronounced at the postsecondary level. Postsecondary state agencies also seem to have less effect on local programs than do their secondary counterparts. This diminished impact may be related to a perception that Perkins is intended more for secondary than for postsecondary education.

State support for Perkins reforms also seems to affect local implementation. Only a minority of districts reported strong state support for Perkins reforms in 1991-92, but greater state support and activism were associated with more local reform efforts in areas such as integration and performance standards, even when other factors were taken into account. State support improved markedly in the second year of Perkins implementation, as states completed work on their performance standards and turned to other aspects of reform.

The 1990 Perkins Act, like its predecessors, assumed that vocational educators would be primarily responsible for implementing provisions of the Act, including reforms such as integration. Yet vocational educators are a minority within the larger system, and they are often regarded as outside the mainstream. Hence, they are sometimes at a disadvantage in fulfilling their responsibilities, having to "sell" reforms to other educators who may not be interested in them. A new approach is needed to remedy this problem.

Recommendations: The new Perkins Act should encourage state education establishments **as a whole** to take a leading role in formally restructuring work-related education. The goal should be to develop comprehensive career preparation systems encompassing, at a minimum, all secondary students who would otherwise be pursuing a vocational or general education program. The conclusion to this summary outlines one model of such a system.

The new Act should help assure that states wanting to take leadership roles in reforming work-related education have the financial and technical resources to do so. To engage the energies of state education establishments in restructuring work-related education, Congress should consider using some portion of Perkins grant funds for competitive grants to states that propose, and show promise of effecting, comprehensive reforms consistent with the goals of the Act. Since some states have already initiated such reforms, it might be useful to distinguish between grants for developing reform plans and others for facilitating implementation.

The new Act should approach the reform of postsecondary vocational education recognizing that its history, structure, and processes are different from those at the secondary level. Hence it should tailor its provisions for the two levels differently, as appropriate.

7. *Performance Standards and Measures.* The Perkins requirement that states develop performance standards and measures for vocational education, and that local grant recipients implement them, is an important first-wave reform. The Act calls for an evaluation of the effect of performance standards on the delivery of vocational education services.[12] How well are states doing in developing the required standards and measures? To what extent is local implementation of standards and measures occurring? (See Volume III, Chapter 2.)

Findings: As of 1991-92 state agencies had given a high priority to developing performance standards and measures, but local implementation had not yet occurred. Most states went beyond the requirements of the Perkins Act, developing fuller arrays of performance measures than required and applying them to all vocational programs, not just those receiving Perkins funds.

While state agencies were developing Perkins performance standards in 1991-92, local administrators were giving more attention to other Perkins reforms such as integration and tech prep. The 1992-93 school year saw noticeable increases in the proportions of districts and postsecondary institutions reporting assessment data to states, suggesting that local implementation was under way. In 1992-93 about half the districts said there had been an increase in state support for program assessment and accountability.

Current implementation efforts face a number of problems, none of them insuperable. First, implementation is demanding and time consuming, because it often involves modifying the data collection procedures of many local assessment systems in a state. Some state administrators are reluctant to impose additional data collection requirements on localities. Second, states and localities have had difficulty adopting learning outcome measures. The absence of widely accepted industry skill standards and assessment instruments makes it difficult to assess occupational gains at both the secondary and postsecondary levels. Many postsecondary institutions also have difficulty measuring academic gains. Third, too little attention has been paid to how local educational systems will actually **use** standards and measures to evaluate and improve local programs, and there has been too little training and technical assistance on this subject.

Recommendations: The new Perkins Act should encourage states and localities to give more attention to the way in which standards and measures will be used to evaluate and improve local programs. The new Act should provide for federal technical assistance to states in implementing and using their accountability systems, and should also encourage states to provide training and technical assistance to localities on this subject, as needed.

The Act should emphasize the assessment of students' cognitive skills and broad technical skills, especially at the secondary level. The occupation-specific skills of students preparing to take full-time jobs directly after program completion should also be assessed at both levels.

Given the importance of relating vocational training to demand in the labor market, the new Act should encourage the use of employment outcomes, especially training-related jobs, as a measure of performance.

Other recommendations regarding standards and measures are found in Number 8, below.

8. *Industry Skill Standards* . Skill standards development has become an important component of federal policy outside the Perkins Act. The Goals 2000: Educate America Act establishes a National Skill Standards Board to encourage the creation of a comprehensive system of voluntary skill standards and certification. The Departments of Education and Labor have funded grants to 22 private sector business-education-labor technical committees to promote the development of skill standards and certification in a variety of industries. Further, the Departments of Education and Labor are supporting a validation of the SCANS skills, and that project may provide the basis for a flexible standardized test of occupational competencies. To what extent are federal efforts such as these consistent with the states' development of performance standards and measures under the Perkins Act? What are the advantages and disadvantages of national skill standards? What form should they take? (See Volume III, Chapter 3.)

Findings: So long as they are voluntary, national industry skill standards and measures are unlikely to disrupt the performance systems states have developed in response to Perkins. Two of the five Perkins options for these systems are assessments of student occupational competency and assessments of job- or work-skill attainment. Since states often lack access to appropriate and reliable occupational standards and assessment instruments, most have left their selection or development to localities. In general, the availability of national industry skill standards and measures would fill a gap in the newly developed state systems, rather than disrupting them. It would also make data more comparable, both within and across states.

Evidence regarding the advantages and disadvantages of national skill standards, whether voluntary or not, is very modest. Much of the justification for such standards is based on policy inferences from well-documented problems. Job instability in the youth labor market is one such problem; it may be symptomatic of an inefficient system for matching training and jobs. Some studies argue that national skill standards could improve the training/job match, thereby increasing job tenure and market efficiency. However, countries that use national skill standards and have better matches also have other structural mechanisms, such as apprenticeship programs, for improving the match.

Another problem is a low level of motivation by secondary students to acquire the skills necessary for the workplace. Some economists argue that this is due in part to the lack of a means by which students can represent or "signal" their skills to employers, and by which employers can be confident the representations accurately reflect skills. (High school diplomas certify such a wide range of accomplishments that they do not convey much information.) Thus, students have little incentive to work hard and acquire the skills they need for the workplace. If students were assessed and certified on the basis of appropriate and widely understood standards, employers would be better able to identify

and hire those with the necessary skills. Under this arrangement, students would be able to see a connection between their work in school and their chances in the job market, according to this argument. The portability of nationally recognized skill certificates would greatly increase those chances.

A taxonomy with three levels of skill standards, and related certification, is proposed in this report. The three levels are 1) academic and work-related education standards; 2) industry-level or occupational cluster standards; and 3) occupational or job-specific standards. In the proposed system, education and training for work would proceed through each level sequentially. Level 1 standards describe the knowledge students should master before leaving high school, or possibly earlier. Level 3 standards are characteristic of most occupational certification in the United States (e.g. electrician, hairdresser, nurse). These standards give shape to many vocational curricula and are the ones being developed by most of the business-education-labor technical committees supported by the Departments of Education and Labor. Level 2 standards are not well developed, and hence school curricula are not designed to meet them. These industry or occupational cluster standards require cognitive skills and broad, technical skills that are compatible with emerging high-performance workplaces and that increase workers' abilities to learn new jobs and undertake new careers.

Recommendations: The federal government should support the development of industry skill standards and valid, reliable instruments for measuring work-related skills. In the process, the federal government should emphasize the development of Level 2 standards and measures.

States should use industry skill standards and measures (as available) in competency-based assessments of workforce preparation programs.

9. *Academic/Vocational Integration.* Integration, tech prep, and work experience programs are prominent in second-wave restructuring reforms and are key elements in the school-to-work transition, which the Perkins Act calls upon the National Assessment to describe and evaluate.[13] We begin with the integration of academic and vocational curricula, a required use of Perkins funds.[14] How extensive is it and what evidence is there of its effectiveness? (See Volume III, Chapter 4.)

Findings: In the first year of 1990 Perkins implementation (1991-92), integration efforts were widespread among secondary **state agencies**, less so among postsecondary agencies. State support for integration was rather modest (though effective, where provided.) By the second year (1992-93) integration-related activities were growing more rapidly among postsecondary agencies, but were still not as extensive as in secondary offices. At both levels, the principal activities were purchasing applied academic materials and providing training and technical assistance to localities. The training of postsecondary faculty showed particularly rapid expansion in the second year of Perkins implementation.

At the local level, most **districts and schools** had taken some specific steps to integrate their curricula by 1991-92. Districts receiving Perkins basic grant funds were more likely than others to report taking such steps, and vocational districts were more likely than regular districts to do so.

Although many districts reported integration efforts by 1991-92, those efforts were not very well developed. Teachers lacked time to work on integration; there was little academic content in vocational classes and less occupational content in academic classes; and modification of existing vocational classes was the integrative approach favored by most schools.

The second year of Perkins implementation (1992-93) saw some improvement in efforts to integrate. State support for integration increased. Many more districts provided time for teachers to work on integrating curricula. Cross-curricular integration and the development of coherent sequences of academic and vocational courses were among the integrative approaches most often pursued. The purchase of applied academic materials was an important but not dominant approach to integration.

Nevertheless, integrated education as the norm in American high schools is still a long way off. The Community Case Studies, conducted in 1992-93, found relatively few examples of fully integrated courses, let alone curricula. One problem seems to be the need for a framework within which integration can take place. Some districts are using tech-prep programs as the framework, but these programs are usually small, and their potential for growth remains to be seen. (A framework is suggested in the model at the end of this summary.)

Although a few applied academic courses have been accepted as satisfying admission criteria at some universities, most have not been evaluated, and their quality has yet to be determined. More generally, a great deal of attention needs to be paid to the **quality** of integrated education.

The division between the secondary academic and vocational systems is still so pronounced that they often comprise separate cultures within schools. Academic teachers are more likely to coordinate courses among themselves than with vocational teachers, and vice versa. Long-established assumptions and patterns of behavior generate resistance to integration. The resistance seems to be stronger among academic teachers and administrators, but is by no means absent on the vocational side. Moreover, the slowly increasing participation of special population students in vocational courses and schools may tend to increase the separation of the two spheres.

To what extent the resistance will dissipate, and to what extent the small current efforts will develop into more systemic integration are still unclear. If the goal of Perkins is integrated education for most secondary students, we could say that

states and districts have completed the first few miles of a long journey. The prospects for systemic integration seem to be best in states that undertake broad-based reforms to improve the workforce preparation of students.

At the **postsecondary level**, substantial elements of curricular integration predated the 1990 Perkins Act. As of 1991-92, postsecondary institutions were more likely than local districts and schools to use cross-curriculum materials and to provide interdisciplinary courses. Just under three-fourths of postsecondary institutions had developed applied academic courses such as technical math and business English. They are almost twice as likely as secondary schools to provide "tandem" academic and vocational courses.

Further, the great majority of postsecondary institutions (83 percent) required general education competencies for vocational students. Demonstrating these competencies usually involves passing a prerequisite academic course or taking a co-requisite academic course along with a vocational course. In somewhat over half of the postsecondary institutions (58 percent), vocational faculty are involved in establishing general education competencies.

Most postsecondary institutions continued to provide the accustomed forms of integrated education after the 1990 Perkins Act. In contrast to the secondary level, there was no great expansion of integrative activities across institutions, with one exception — a marked increase in faculty training for integration.

It is still too early to assess the **effectiveness of integrated education** in terms of academic and employment outcomes. However, there is evidence that "contextualized learning," that is, education in a context that enables students to relate schoolwork to the world outside of school, is a more effective pedagogical approach than traditional education, which emphasizes knowledge for its own sake. There is also evidence from the military that a contextual approach to training results in better job performance than other methods, and some suggestive (but inconclusive) evidence that the military's use of a contextual approach to adult literacy training is relatively effective.

On the other hand, there is not much systematic evidence that integrated academic/vocational education in schools is effective — in part because not much systematic research has been conducted. The best research on the subject has focused on career magnet schools and career academies. Careful studies of these programs found positive effects on students during their first year of participation, but the effects faded in subsequent years. Nevertheless, some first-year effects such as fewer failed courses were not lost, and overall dropout rates were lower for students in California career academies. There were also positive effects for some programs and practices in New York magnet schools.

All Aspects of the Industry. One way to integrate curricula is to provide students with instruction in all aspects of an industry — for example, teaching

carpentry students about managing a construction business, handling labor relations, and meeting environmental regulations. Such instruction would better enable workers to start their own businesses or to move up in companies.

Local recipients of Perkins basic grant funds are encouraged to use the funds to provide vocational education in programs that "train adults and students for all aspects of the occupation, in which job openings are projected or available."[15] Other parts of the legislation reinforce the Act's emphasis on what is commonly referred to as training in "all aspects of the industry." How extensive are efforts to implement this provision of the Act?

The *Interim Report* found that in 1991-92, the first year of 1990 Perkins implementation, relatively few states and localities were working to promote education in all aspects of the industry. For example, only 14-25 percent of secondary state agencies had taken specific steps toward this end, and only about one-fourth of the secondary districts said that "all aspects" education had increased since 1990-91.

The picture was markedly different by the spring of 1993. For most of the listed steps, the percentage of active states had at least doubled. For example, the proportion of state secondary agencies providing recommended curriculum frameworks or guidelines to local districts increased from 25 percent to 60 percent. Further, two-thirds of regular districts reported that activities in this area had increased in the last three years, up from one-fourth the year before.

In the first year of Perkins implementation, states and districts were clearly focusing on things other than education in all aspects of the industry. By the second year, the majority of states and districts had begun to take steps to implement provisions of the Perkins Act in this area.

Recommendations: The new Perkins Act should continue to support academic/vocational integration. Eliminating the deep division between the academic and vocational "cultures" in secondary schools should be one of the major goals of the legislation. Another major goal should be the development of cognitive skills through integrated instruction, particularly at the secondary level.

The new Act should continue to encourage education in all aspects of the industry and should provide an operational definition of the term, taking into account that many states have already developed their own definitions.

The new Perkins Act should encourage states to support integration and instruction in all aspects on an industry within the context of industry-based or other broadly applicable majors in reformed systems of workforce preparation.

The new Act should support the development of high-quality, integrated curricular materials benchmarked to world-class Level 2 standards, and emphasizing the development of cognitive skills, broad technical skills, and understanding of industries. One way to further this effort would be to support consortia of states working together to develop these curricular materials.

The new Act should also support systematic research on the quality of integrated academic/vocational programs and the quality of applied academics materials.

10. *Tech-Prep Programs.* Tech prep is another Wave II reform, a major provision of the Perkins Act with separate funding (in Title III), and a component of the school-to-work transition. The Perkins Act specifies the key elements of tech prep as (a) an articulation agreement among tech-prep consortium members, such as school districts and community colleges; (b) two years of secondary and two years of postsecondary education (or apprenticeship) leading to a degree or certificate; (c) a common core of required proficiency in math, science, and communications; (d) technical preparation in specified occupational fields; and (e) placement in employment. The Act calls for an assessment of the "articulation between secondary and postsecondary programs,"[16] and by implication, tech-prep programs. How extensive and how well developed are tech-prep programs? (See Volume III, Chapter 5.)

Findings: Tech-prep initiatives have expanded tremendously since the concept was first introduced in the mid-1980s. The 1990 Perkins Act added impetus to a movement already well under way. Part of the appeal of tech-prep programs seems to be that they have natural constituencies. Two-year postsecondary institutions and secondary vocational programs both anticipate increased enrollments of higher-achieving students attracted by tech prep.

While expanding rapidly, tech-prep initiatives come in a bewildering variety of shapes and sizes. Many are limited to course articulation agreements. Some are nothing more than relabeled secondary vocational courses or work experience programs; others may comprise one or two applied academic courses. Still others are new and tentative, but reflect a serious commitment to long-range development; and a small number are well-established programs resembling the Perkins model. Most tech-prep programs do not have formal enrollments, and definitions of tech-prep students are at least as variable as those of programs.

In 1993, almost half of all secondary districts (5,441 out of 11,527) reported having tech-prep agreements with postsecondary institutions. However, the number of tech-prep programs shrinks rapidly when definitional and other criteria are applied. An estimated 399 secondary districts had tech-prep programs that both met the Perkins definition **and** had sent at least some students on to postsecondary institutions. Only 44 postsecondary institutions reported tech-prep programs that met the Perkins definition **and** had at least

some tech-prep graduates. Even under these more restrictive definitions, the estimated number of programs may be high, for a variety of reasons.

Nevertheless, there was visible progress between the first and second years of Perkins implementation. The number of states using their own funds to support tech prep jumped from 7 to 19 in this period. Moreover, in 1992-93 most tech-prep programs had enrolled their first students, in contrast to the previous year, when the majority had no students. Further, in the small number of sites where student retention can be estimated, the rates are quite respectable. A median 79 percent of students in these districts are estimated to complete the secondary part of the tech-prep program, and a median 47 percent make the transition to the postsecondary part. Of those entering postsecondary tech prep, a median 58 percent are estimated to graduate. These estimates come from a small number of sites and may be high, but on the whole, they are encouraging.

As with integration, the key question for the future is, how many tech-prep initiatives will grow into well-developed programs that are consistent with Perkins and encompass sizable numbers of students? Alternatively, how many will disappear or persist as small modifications of the status quo?

With regard to equity issues, Perkins Title III tech-prep awards are largely independent of the proportion of special population students in a district. Tech-prep programs are being developed primarily for "the average student." Most districts are making provisions for special populations in tech prep, but their participation is usually not a priority.

Recommendations: The new Perkins Act should continue to support tech-prep programs, but should require states to verify that Title III grant recipients are building comprehensive, structured tech-prep programs that (a) meet the current Perkins definition of tech prep, including the goal of a postsecondary degree; (b) are articulated at the program or industry level; and (c) formally enroll, enumerate, and follow the progress of tech-prep students.

To ensure equity, states and districts should place greater emphasis on preparing special population students to participate and succeed in tech-prep programs.

The government should conduct rigorous evaluations of tech-prep programs. The evaluations should assess program effects on outcomes such as student competencies, transition to postsecondary institutions, attainment of postsecondary credentials, and subsequent employment and earnings.

11. *Work Experience Programs.* A third element in the school-to-work transition is work experience programs, including formal work-based programs such as cooperative education and youth apprenticeship, and other less formal kinds of work experience. As a final step in addressing the Perkins mandate to assess the school-to-work transition, we examine these ways in which work may contribute

to education and workforce preparation. How extensive are these programs, and what evidence is there of their effectiveness? What is their potential for future expansion? (See Volume III, Chapter 6.)

Findings: Cooperative education is the oldest and most widespread of the work-based programs. Most secondary districts and postsecondary institutions have co-op programs, and over 400,000 secondary students participate in them. Systematic research indicates that students and employers like co-op programs, but evidence of positive academic or occupational outcomes is conflicting and inconclusive. (However, disabled students seem to derive employment benefits from work-based programs in general.)

New youth apprenticeship programs, in which students receive their occupational skill training on the job under the supervision of mentors, are generally small and few in number. A 1993 canvass of states located 55 youth apprenticeship programs, broadly defined. The typical (median) program served about 20 students; the average (mean) number of students was 60. Altogether, the programs enrolled about 3,400 students.

Apprenticeship programs have not been rigorously evaluated, so there is no systematic information about their effectiveness. However, there are some positive signs. Student continuation rates over one year are very high — on the order of 95 percent. Moreover, as noted in Number 5 above, employers who participate in youth apprenticeship (and co-op) programs have strongly positive opinions of them.

Unlike tech-prep initiatives, youth apprenticeships and other intensive, formal, work-based programs do not have widespread pre-existing constituencies. They usually depend on participation by private-sector employers, and on balance they entail additional costs to employers. Many labor unions are opposed to youth apprenticeships. On the education side, if skill training were shifted primarily to the workplace, vocational programs would experience further enrollment losses.

Apart from formal work-based programs, about one-third of secondary students work while in high school, and they may derive some benefits from doing so. Working up to 15–20 hours a week does not seem to depress grades and is positively associated with earnings after graduation and/or with later college attendance. Self-selection may cause some of these effects.

The biggest difficulty in making formal, work-based programs a major part of secondary education is what has become known as "the problem of scale." There are over 5 million high school students in grades 11 and 12. Co-op programs currently include somewhat over 400,000 students (8 percent of those in grades 11 and 12) and apprenticeship programs include several thousand. It is proving difficult to recruit employers and to keep them once recruited. The costs of

training, supervision, and compensation, together with negative employer opinions about the quality of young workers in general, are major obstacles to greater employer participation. Efforts by the British government to subsidize apprenticeship programs by giving students a living allowance in lieu of wages attracted employers, but had unexpected negative effects.

More limited forms of work experience and employer involvement might be a more feasible means of expanding opportunities for students to participate in this form of learning. In particular, efforts to relate jobs that students get on their own to education in such areas as employability skills and labor-force supply and demand should be pursued.

Recommendations: The federal government should continue to explore ways to expand work experience programs. Attention should be given to new approaches that have the potential to involve large numbers of students.

The government should conduct rigorous evaluations of formal work-based programs. The evaluations should assess program effects on outcomes such as student skill competencies, student retention, and subsequent employment and earnings.

Formal work-based programs should be developed on an incremental basis, consistent with economic principles. The government should carefully assess these programs' potential for expansion and review evidence pertaining to employment outcomes before considering any major commitment of resources to them.

C. Equity in Vocational Education

12. ***Access for Special Populations.*** As part of its effort to help special population students, the Perkins Act requires states to provide assurances that these students have equal access to vocational education and that localities ensure their full participation in programs improved with Perkins money.[17] As part of its mandate to the National Assessment, the Act also calls for an examination of the "participation in vocational education programs, including, in particular, the access of . . . special populations to high-quality vocational education programs."[18] The previous National Assessment identified area vocational schools as among the principal providers of high-quality secondary vocational education and found that special population students had less access to them than students in general. Has this access pattern changed? More broadly, what are the patterns of access and participation for special population students at the secondary and postsecondary levels? (See Volume II, Chapters 1 and 2.)

Findings: At the **secondary level**, access of special population students to area vocational schools (AVSs) is still more limited than that of other students, because special populations are located in central cities and rural areas out of

proportion to their numbers, while most area vocational schools are in suburban areas. As the *Interim Report* noted, however, two factors tend to offset this limitation. First, in many large cities, vocational high schools, including career magnets, provide access to special population students, among others. Second, comprehensive high schools with access to AVSs send a disproportionate share of special population students to them. Area vocational schools have higher concentrations of special population students than do comprehensive high schools, but this development can have serious drawbacks, as discussed below. Of particular concern is the shrinkage and growing isolation of some vocational programs.

One access issue not discussed in the *Interim Report* concerns the availability of Perkins funds to occupationally oriented schools that exclusively serve special population students, such as alternative schools for students with behavior problems. In at least 40 percent of the states, schools such as these do not receive Perkins funds because they do not meet the minimum eligibility requirements, or for other reasons.

In the context of a general decline in secondary vocational enrollments, special population students — particularly the disabled and disadvantaged — are overrepresented in secondary vocational education. For example, in 1992 the 34 percent of all high school graduates who were members of special population groups earned 43 percent of all vocational credits. Special population students are a somewhat larger proportion of all vocational students now than they were ten years ago, and higher achieving students are a smaller proportion. In some districts, vocational education programs, especially those in area vocational schools, are becoming the province of the hard-to-educate. (See Section II above.)

Disabled and disadvantaged students tend to concentrate their vocational coursetaking in certain program areas — agriculture, occupational home economics, and the trades — while taking relatively few courses in other areas — business, health, and, most notably, technical education. It is unclear whether these coursetaking patterns serve the students' interests, but given the growing importance of computer literacy in the workplace, their lower rates of enrollment in business and technical courses seem to be a problem.

Vocational enrollments continue to be highly sex-typed at both educational levels. Students in the trades, agriculture, and technical programs are mostly boys, and those in business, health, and occupational home economics are mostly girls. Over time, boys have increased their participation in business courses, but girls have not increased their enrollments in traditionally male fields.

Postsecondary vocational programs serve a wide array of students, particularly special population students, by providing courses in diverse and accessible institutions. Blacks, Hispanics, and disabled students are overrepresented in postsecondary vocational education, but LEP students are underrepresented.

Some institutions have difficulty meeting the needs of LEP students, especially in areas where large and growing disadvantaged and immigrant populations strain institutions' resources.

During the three-year period from 1986 to 1989, the concentration of special populations in postsecondary vocational education did not increase, as it did at the secondary level, over a longer period.

Minority and special population enrollments are higher in proprietary schools than elsewhere, and proprietary school enrollments are increasing. These enrollments seem to reflect a demand for short-term postsecondary programs designed to improve earnings quickly. The conflicting needs for more education and immediate income reflected in this preference are likely to continue.

Completion rates in sub-baccalaureate postsecondary institutions seem to be declining, and the increasing number of postsecondary students needing remediation may be contributing to this decline. Recent reforms, such as the elimination of remedial course credits and stricter academic requirements for vocational certificate students, may also contribute to lower completion rates. These trends emphasize the need to focus on the most fundamental determinant of access to postsecondary education — high school students' **preparation for** further education.

Recommendations: To counter the growing isolation of secondary vocational programs, the new Perkins Act should encourage states and localities to broaden the student base of vocational education by creating reformed systems of workforce preparation that encompass the majority of secondary students. The Perkins Act should also maintain strong requirements for equal access to occupational programs, but should not otherwise encourage the enrollment of special population students as groups in any particular form of education. Decisions about programs and coursetaking should be made on the basis of the educational interests of the individual student. Congress should help special population students meet the same standards as other students, regardless of the programs they participate in.

To improve the access of special populations to quality vocational education, regardless of the school in which they are enrolled, the Perkins Act should (a) maintain its focus on targeting funds to schools and districts that serve special population students, with efforts within those sites focused on reform and program improvement; (b) require that states include public schools that provide vocational education exclusively to special population students in their Perkins funding allocations; and (c) target funds more closely on postsecondary institutions with large and growing concentrations of special population students, especially immigrant populations (or some other measure of LEP student concentration).

13. ***Targeting Special Populations.*** The 1990 Perkins Act eliminated categorical funds set aside for disabled, disadvantaged, and LEP students in the 1984 Act, while continuing those for sex equity, single parent, and corrections programs. The elimination of the set-asides was intended to give localities more flexibility to improve their programs. At the same time, to help assure that the needs of special population students would continue to be met, the Act's within-state allocation formulas were designed to target funds on districts and postsecondary institutions with large shares of a state's special population students.[19] Did such recipients tend to get larger grants than others? (See Volume V, Chapter 1.)

Findings: Secondary districts and postsecondary institutions with more special population students, and higher proportions of these students, did receive larger basic grants than others in 1991-92. Perkins basic grant funds were already targeted on recipients with large numbers of special populations in 1990-91 (under the 1984 Act), and the targeting increased after the new Act. These patterns are stronger at the secondary than at the postsecondary level.

Recommendations: As in Number 12 above.

14. ***Impact on Services.*** The elimination of set-asides for special population students raised concern that services for these students might be cut back. To prevent this from happening, the 1990 Perkins Act requires basic grant recipients to address the needs of special population students and to provide assurances that they are doing so.[20] The Act also calls for an assessment of its effect on services for special populations.[21] Have these services been reduced under the new legislation? (See Volume IV, Chapter 1.)

Findings: The *Interim Report* found that services for special population students were not reduced under the new Act. At both funded and unfunded sites, services increased slightly between 1990–91 and 1991–92. The current report shows that by 1992-93, services had increased further. The increases were greater in funded than in unfunded districts, suggesting that the loss of the set-asides did not lower the level of service provision. Also, local administrators report that the Perkins Act has had a positive effect on support for special population students.

In general, the use of Perkins funds to provide services for special populations seems to have become institutionalized at the local level. Perkins funds support a wide range of support services, with learning-related services (such as tutoring and learning centers) being the most commonly supported.

The Perkins Act encourages the use of funds for guidance, counseling, and assessment, and Perkins funds are also frequently used to support these services. Guidance services are also the supplemental services localities are most likely to offer (with any funds), though there is little solid evidence that they benefit vocational students. The potential benefits from improved instructional quality

— through program reform and learning assistance — appear to be greater than those gained from the increased use of ancillary personnel and services that do not directly improve the learning process.

The general focus on service provision within the Perkins Act is troublesome because it implies that students with special needs should — as a group — be enrolled in vocational education. Although this was not the original intent of the Act, it is often interpreted this way in states and localities. Services for special needs students should be equally available to all who need them, regardless of the program in which they are enrolled.

Recommendations: The Congress should reconsider the rationale for providing funds for supplemental services within federal vocational education legislation. To best serve the educational interests of these students, the Perkins Act should give even greater emphasis to reforming and otherwise improving the quality of vocational programs within localities that serve these students, and should limit service provision to those services that directly improve student learning.

15. ***State Activities in Support of Special Populations.*** To help ensure that the needs of special population students are addressed, the Perkins Act requires that states monitor the access of special populations to vocational education; include representatives of special populations in reviewing local applications for Perkins funds; and adjust performance standards or provide incentives to encourage service to special populations.[22] To what extent are states complying with these Perkins requirements? (See Volume IV, Chapter 1.)

Findings: At both secondary and postsecondary levels, equal access seems to be a major focus of states' Perkins reform efforts. States are as active in this area as they are in most other Perkins initiatives. Compliance with equal access requirements and assurances is high, although it is not universal.

State compliance rates are highest for activities that are clearly mandated in the 1990 Act (e.g., involvement of state special population representatives in review of local plans), but not as high for activities that are less specifically mandated (e.g., participatory planning requirements).

Adjustments to performance standard systems for special populations are not widespread. The reasons for this apparent shortcoming are unclear, but states may be focusing on the language of the provision, which requires performance systems to include "incentives or adjustments. . .designed to encourage service to targeted groups or special populations." There is a good deal of ambiguity and latitude in this language. Also, states may be having trouble determining how to make adjustments; they overestimated their ability to do so by 1992-93.

State assistance to localities on special population matters was limited in the first year of Perkins implementation (1991-92) but increased markedly in the second.

Nevertheless, localities could still use more assistance from states, and states could use more assistance from the federal government on these issues.

Recommendations: To ensure that equal access and participatory planning are implemented as intended, the Perkins Act should be as explicit as possible about Congressional intent. For example, a clearer definition of participatory planning and statement of intent on this issue would be useful. The same is true of adjustments to performance standards.

As in other priorities, the new Perkins Act should emphasize the states' role in improving occupational education for special population students and ensuring equal access.

16. ***Sex Equity and Single Parent Programs.*** The Perkins Act requires states to set aside 10.5 percent of basic grant funds for programs to eliminate sex bias in vocational education and programs for single parents, single pregnant women, and displaced homemakers (called "single parent" programs here).[23] To help concentrate these state-allocated funds on a limited number of local sites, the Act requires that grants be competitive. The Act calls for assurances that states will "emphasize assisting individuals with the greatest financial need" in awarding single parent funds. The Act also funds a position for a sex equity administrator in each state. Have sex equity and single parent grants become more concentrated in fewer sites? Are individuals with the greatest financial need most likely to receive Perkins-funded single parent services? What are the roles and responsibilities of sex equity coordinators, and what should be the scope of the state's role in sex equity programs? (See Volume IV, Chapter 2.)

Findings: Competitive awards under the 1990 Perkins Act have helped concentrate sex equity and single parent grants in larger awards to fewer sites than existed under the 1984 Act. However, sites with high concentrations of special population students are no more likely to receive single parent grants than sites with low concentrations. Instead, localities seem to be giving priority to "individuals with the greatest need" within sites, rather than across them.

Almost all two-year postsecondary institutions offer sex equity programs or services, although over one-fifth of area vocational schools and one-half of regular school districts offer none. Recruitment and counseling are the most commonly offered sex equity services; counseling and job placement are the most commonly offered single-parent services.

Perkins funding is associated with increased services for both target groups, more so at the secondary than the postsecondary level. (Postsecondary institutions may concentrate their efforts on fewer, more costly services.) Locally delivered single-parent programs seem to be more coherent and effective than sex equity programs. Perkins-funded state sex equity administrators have

increased authority and responsibility under the 1990 Perkins Act, but often lack the time for all their new responsibilities.

Recommendations: The new Perkins Act should require that in awarding single parent grants, states give priority to localities that are the most economically depressed and/or have the highest concentrations of targeted populations.

The Perkins Act should concentrate sex equity efforts at the state level. State leadership and activism can probably promote more extensive and effective change in attitudes, behaviors, and programs than is possible through local grants.

The new Act should prioritize the major responsibilities of state sex equity coordinators to assure that the most important responsibilities are fulfilled.

17. *Vocational Education Serving Native Americans.* It is federal policy to promote Native American tribal development and self-sufficiency. The Perkins Act designates 1.25 percent of its total funds to support vocational education programs administered by Indian tribes.[24] In 1991-92 approximately $11 million was allocated via competitive grants to 38 tribes. What role does Perkins funding play in tribal vocational programs? How effective are the programs it supports in achieving the government's goals? (See Volume IV, Chapter 3.)

Findings: Perkins-funded vocational education programs play a key role in tribal efforts to achieve self-sufficiency. Perkins requirements that funded programs be developed on the basis of a local needs assessment and that funding priority be given to programs linked to tribal economic development plans seem to be having the desired effects.

In general, the Perkins-funded programs have high job placement rates, strong student interest, and the support of the local community. They foster tribal development efforts by helping to supply the trained workforce that local employers need.

There are exceptions to these generally positive outcomes, however. Most notable is the fact that Perkins-funded programs have had only limited success in meeting the large demand for health care workers on reservations. There are few health programs, and those that exist tend to have very small enrollments. The underlying problem seems to be that too many students lack the basic skills necessary to enter these rigorous and selective postsecondary training programs.

In addition, although the competitive award process seems to help assure program quality, the temporary nature of the grants causes organizational and personnel problems.

Recommendations: The new Perkins Act (and other federal legislation) should further strengthen the linkage between vocational training, tribal economic needs, and economic development efforts.

The preparation of Native American students to enter postsecondary health care programs and the availability of such programs also deserves greater federal attention.

Congress should consider ways to alleviate the instability of the Perkins grants to tribes.

18. *Vocational Education in Correctional Facilities.* Criminal offenders are an additional special population group targeted by the Perkins Act. The Act designates that one percent of a state's basic grant be used to support vocational education for this population (defined here as those in correctional facilities.)[25] Since one percent might be less than was allotted to correctional facilities under the previous Perkins Act, the 1990 Act contains a "hold harmless" provision to ensure that no state receives less under the new Perkins Act than under the old. Federal funds for correctional vocational education can also sometimes be obtained through participation in Perkins basic local grants to LEAs and from other Perkins programs. What is the nature of education within correctional facilities? How are Perkins funds allocated within this sector?

Findings: Education in correctional facilities faces a number of unique and potentially debilitating problems. Inmates tend to have extraordinary personal, social, and educational handicaps. Correctional vocational education programs must compete with many other programs and interests, including prison industry and maintenance programs, counseling, drug and alcohol rehabilitation, and basic education programs. Vocational programs also face the day-to-day interruptions and inefficiencies created by security needs, overcrowded conditions, and the often unexpected departure of inmates before programs can be completed. Lack of public and political support, and problems with funding, staffing, and equipment are further obstacles. In spite of these problems, vocational programs are popular in correctional facilities, and serve a fairly representative cross-section of the inmate population.

A key question is whether correctional education programs help reduce recidivism. There is some fragmentary evidence suggesting positive effects on inmates' attitudes and post-release behaviors, but more reliable, systematic research is needed.

In most states, Perkins funds for correctional vocational education are broadly disbursed to both adult and juvenile agencies. In at least six states, correctional education agencies have lost funding under the new Perkins Act, in spite of hold harmless provisions. In three of these states, the loss of funds occurred in

compliance with the law, but three others may not be in compliance. More information is needed before any conclusions can be reached.

Perkins funding is notably larger in the 41 state correctional education agencies that are deemed LEAs for Perkins Act purposes and are therefore eligible for basic grant funds. States that make this designation are likely to be more committed to correctional education in general.

Finally, state corrections education administrators have varying degrees of participation in Perkins planning and decision-making, with most having some input, but one-fifth to one-fourth having none.

Recommendations: In the new Perkins Act, state correctional education officials should be afforded more direct and consistent means of input into the Perkins planning and decision-making process.

To avoid competition and duplication of effort, the Perkins Act should require that correctional education agencies demonstrate (in their state plans) active coordination of prison industry, education, and vocational training programs. Past efforts to foster coordination have often failed because of an emphasis on institutional cost-recovery: Inmates' production of goods and services becomes more important than the training they receive. The Perkins Act should encourage states to develop safeguards against this occurrence.

19. ***Minority Participation in Vocational Student Organizations.*** Vocational student organizations (VSOs), such as the Vocational Industrial Clubs of America, Distributive Education Clubs of America, and the Technology Student Association, provide vocational students with a range of individual, cooperative, and competitive activities designed to expand their leadership and work-related skills. In 1990 the Department of Education instituted a policy of support for and cooperation with ten federally recognized VSOs. The 1990 Perkins Act permits the use of basic grant funds to support VSOs. It also calls upon the National Assessment to examine the participation of minority students in vocational student organizations.[26] Are minority students equitably represented in them? (See Volume IV, Chapter 5.)

Findings: In general, VSOs appear to be fair, equitable organizations dedicated to improving the leadership and skills of vocational students and the quality of the technical workforce. Across all secondary schools, minority students are represented in VSOs in proportion to their numbers. However, within schools that have VSOs, minority students may be a little less likely than others to join. (This underrepresentation is not reflected in the overall data because high-minority schools are larger, and large schools have more VSO chapters.) At the postsecondary level, minority students are underrepresented in VSOs, both across and within institutions.

School administrators and VSO chapter advisors report that the greatest disincentives to student participation in VSOs are a lack of student interest, conflicts with other student interests and activities (including jobs), and participation costs. Lack of interest and participation costs are perceived as greater barriers in high-minority schools than in low-minority schools. One reason why participation costs may be a more significant barrier in high-minority schools is that students in those schools pay more out-of-pocket than those in low-minority schools. (Chapters in low-minority schools earn more money from fundraising, for one thing.)

Recommendations: The new Perkins Act should encourage VSO chapters where minorities are underrepresented to more actively recruit minority students, especially at the postsecondary level.

Congress should permit or encourage states to allocate modest amounts of basic grant money to defray the costs of VSO participation (including transportation costs) for low-income students and to increase the recruitment of minority students to VSOs, especially at the postsecondary level.

D. Funding and Administration Issues

20. ***Secondary/Postsecondary Funding.*** Perkins Title II basic grants are awarded to the states by the federal government on a formula basis. Each state then decides how the basic grant money will be divided between the secondary and postsecondary sectors. The secondary/postsecondary split has long been of interest to federal policymakers. What is the split, and how has it changed under the new Perkins Act? (See Volume V, Chapter 1.)

Findings: State administrative records indicate that the postsecondary share of Title II basic grant funds declined from 40.2 percent in 1990-91 to 37.8 percent in 1992–93, a 2.4 percentage point decrease. When all Perkins funds, including Title III tech prep moneys are included, however, the reduction was less than 2.4 percentage points. Postsecondary allocations have hovered around 40 percent for the past six years, but seem to have declined slightly in the last two years.

The *Interim Report* found that the combined effects of the federal formula for allocating funds to the states and the secondary/postsecondary split are powerful, and they can result in marked differences in allocations to local districts with similar educational needs. For example, Oakland, California, a city with a 29.1 percent poverty rate for children aged 5–17, received $12.50 per student in grades 9–12 in 1991-92. Philadelphia, Pennsylvania, with a 29.2 percent poverty rate among children of the same age, received $20.97 per student. However, postsecondary institutions in and around Oakland presumably received more per-student funds than those in and around Philadelphia.

Recommendations: Congress should consider whether the Perkins Act should play a role in the division of funds between the secondary and postsecondary sectors.

21. ***Concentrating Funds.*** The last National Assessment of Vocational Education found that Perkins basic grants allocated by states to secondary districts under the 1984 Act were so small and widely distributed that it was doubtful they could have much impact on vocational education programs. (The median grant to regular school districts was $7,900.)

The 1990 Perkins Act attempted to concentrate and target funds by merging the disabled and disadvantaged set-aside funds with the remainder of basic grant funds; by providing formulas for the allocation of basic grants; by setting $15,000 as the minimum size of grants to secondary recipients and $50,000 to postsecondary institutions; and by shifting funds from state administration to localities. Secondary districts that could not qualify for the minimum were permitted to join together in consortia that could qualify. What were the allocation patterns under the 1990 Perkins Act, and how did they change from those under the last year of the 1984 Act? Were Perkins moneys concentrated in bigger grants to fewer recipients? (See Volume V, Chapter 1.)

Findings: At the secondary level, the findings are complicated by the role of consortia. While fewer basic grants were awarded under the new Act, more districts now "participate" in Perkins funding, because many districts are included in consortia. Data from state funding records indicate that the mean basic grant increased from $44,516 in FY91 to $99,616 in FY92, while the number of grants decreased from 7,625 to 3,958. Of the 3,958 awards, 2,825 were to individual school districts and 1,133 were to consortia. The consortia included 8,170 districts (almost three-quarters of all secondary districts).

If these data are correct, 98 percent of districts with secondary vocational programs (10,995 out of 11,274) participate in Perkins funding, either directly or through consortia. Some states are using consortia as the primary mechanism for distributing Perkins funds: In 16 of 43 states for which data are available, more than 90 percent of the districts are in consortia.

While these findings seem to indicate a great increase in the number of districts participating in Perkins basic grant funds (from 7,625 to 10,995), the actual number of districts using grant money is somewhat lower than the data suggest. We estimate that 82 percent of consortium districts are using Perkins funds, roughly the same as the proportion of all districts using them (84%). Nevertheless, these proportions are considerably higher than they were under the 1984 Act, and in this sense, concentration decreased.

At the postsecondary level, the findings are more straightforward. The mean basic grant increased from $178,234 in 1990-91 to $228,627 in 1991-92, and the

number of awards decreased from 1,289 to 1,032. There were no postsecondary consortia in this period, so there was increased concentration of funds under the new Act. However, postsecondary institutions are now allowed to form consortia, and their development will need to be monitored.

The state data also reveal that grants to secondary districts increased in large and middle-sized cities relative to other areas, and grants to postsecondary institutions increased in large cities relative to other areas.

Recommendations: The new Perkins Act should specify the role of consortia at the secondary and postsecondary levels. Given their size, it is important to spell out the conditions under which consortia should be formed and operate. It is particularly important to indicate that consortia cannot be bookkeeping entities established by states to maintain flexibility in allocating funds to districts and postsecondary institutions.

22. ***Administrative Changes.*** To give localities more resources and flexibility to build their programs, the Perkins Act reduced the proportion of funds allocated for the administration of **state** vocational education programs, activities, and plans, and increased the localities' share.[27] The Act calls for an assessment of the effects of the Perkins Act on state administration and the capacity of states to address the priorities in the Act.[28] What effect have these legislative changes had on state administration? On state support for local activities? (See Volume V, Chapter 2.)

Findings: State secondary and postsecondary vocational agencies received about 28 percent less Perkins money for administration in 1991–92 than in 1990–91. Over the three-year period ending in spring, 1993, the average number of employees in state secondary agencies declined from 28.6 to 24.1, though postsecondary agencies did not lose staff. We cannot tell whether or to what extent the Perkins reductions contributed to the staff losses in secondary agencies. However, losses were greatest in the Northeast, where economic conditions in general have been the worst in recent years.

At least partly as a result of staff losses at the secondary level, the workload of the remaining staff increased during this period. In a small subset of state agencies, staffs were reduced by over 50 percent, and the workload of remaining staff members was very high. However, some functions previously performed by vocational staff, such as assessment or professional development, may have been reassigned to other parts of state agencies.

Both secondary and postsecondary state agencies reported increases in staff time devoted to a wide array of tasks between 1990-91 and 1992-93. Activities related to the implementation of the new Perkins Act increased the most, especially the development of performance standards and measures and the coordination of vocational education with other programs. Reports from local districts indicate

that state support for the implementation of Perkins provisions was modest in the first year of Perkins implementation (1991-92) but increased substantially in the second.

Implementation got started more slowly than intended in the Act, in part as a result of federal delays in evaluating state grant applications and in issuing regulations. Much of the delay in issuing regulations appears to have been due to the negotiated rulemaking process and to the many layers of review within the government. Both were reported to be time-consuming and to have little effect on the regulations. Evaluation of state applications was hampered by a lack of criteria with which to evaluate their overall quality (a new federal requirement).

Recommendations: The Department of Education should streamline its procedures for reviewing regulations and develop criteria for evaluating the quality of state plans.

23. ***Coordination of Perkins, JTPA, and Other Federal Job Training Programs.*** Congress has historically been concerned about the potential for overlap and duplication of effort among federal job training programs, and has included provisions for cooperation in the authorizing legislation for the major programs. The Perkins Act calls upon the National Assessment to examine coordination among the Perkins Act, the Job Training Partnership Act (JTPA), the Adult Education Act, the National Apprenticeship Act, the Rehabilitation Act of 1973, and the Wagner Peyser Act.[29] The Jobs Opportunity and Basic Skills Act, though not included in the Perkins list, is a major training program that should also be considered in this context.

How much of a problem is lack of coordination among these programs at the federal, state, and local levels? What measures are being taken to improve coordination? What can be said about the effectiveness of these measures? What additional steps could usefully be undertaken? (See Volume V, Chapter 3.)

Findings: Problems of fragmentation and duplication across some 125 federal education and training programs are real, but should not be overstated. Given the large number of different programs, some overlap is inevitable and may help assure that individuals in need of services do not fall through the cracks. Nevertheless, the cost-effective delivery of services is a goal that should be pursued.

The research suggests that as program administration moves closer to the local level, and to intended clients, cooperation becomes more visible and seems to be more effective. At the federal level, greater coordination across different job training laws is needed. In particular, there is need for a common set of administrative requirements to govern the major programs. Agreement on eligibility definitions, fiscal years, reporting requirements, and planning periods would greatly simplify the work of administrations at all levels of government.

State agencies face the challenge of moving beyond verbal and written agreements and participatory planning to genuine collaboration. By 1993, supercouncils designed to coordinate administration of the various programs had been established in half of the states, although only eight of these were State Human Resource Investment Councils authorized by JPTA. While it is too early to assess the value of supercouncils, anecdotal reports are encouraging, and these organizations seem to hold the promise of greater coordination at the state level.

At the local level, our data indicate extensive interplay between and among JTPA, vocational education, JOBS, community-based agencies, community colleges, and school districts. The set-aside provisions of JTPA and the Perkins coordination requirements seem to have encouraged a variety of effective and innovative collaborative activities.

One-stop centers appear to be a promising innovation at the local level. From the client's point of view, they can provide a single point of entry into an extremely complex system. For agency staff, they make tracking the progress of clients and assessing the utility of services easier.

In general, local officials seem to be fairly successful at knitting together the plethora of job-training programs, or resources from these programs, in a variety of ways to serve their clients.

Recommendations: At the federal level, Congress and the Executive branch should strive to improve coordination among federal education and training Acts. In particular, they should simplify client eligibility, accounting, planning, reporting, and other regulations. They should also consider ways to provide greater flexibility to state and local agencies.

States should be encouraged to use funding as an incentive for local programs to coordinate programs. A focus on the potential benefits of coordination, rather than on eliminating perceived barriers, might better persuade institutions to coordinate with job training programs.

The development of supercouncils should continue to be encouraged, as should that of one-stop centers. Congress should consider coordination set-asides for special initiatives such as one-stop centers, while providing controls to assure that coordination funds are used for their intended purpose.

IV. CONCLUSION AND FUTURE DIRECTIONS

The second wave of the education reform movement has performed an invaluable service in calling the nation's attention to the educational needs of non-college-bound students. It seems clear that shortcomings in the education of these students are the most serious problem in secondary education, one which

substantially affects their performance relative to that of students in other countries and which contributes to the poor labor market outcomes of high school graduates.

The 1990 Perkins Act attempted to remedy some of these shortcomings by setting a reform agenda for vocational education — the development and implementation of performance standards, integration, and tech prep. It assigned the development of performance standards to the states and tried to stimulate integration and tech prep at the local level. The states have done a reasonably good job of developing performance standards. However, the implementation of integration and tech prep has been somewhat haphazard, and these reforms lack depth and coherence.

The next Perkins Act (together with other related federal education legislation) should expand its reform agenda to restructuring education for non-college-bound students in order to effectively prepare them for work. In so doing, it should rely more on states to develop restructuring plans, and within such frameworks, to give local reform efforts greater coherence and direction. It should also rely more on the federal government to help develop resources to facilitate reform, such as industry skill standards, occupational competency tests, and curricular materials.

The goal of reform should be to create new systems of workforce preparation that will:

- Encompass all non-college-bound and some college-bound students.
- Prepare students for careers rather than jobs.
- Broaden the curriculum framework from occupations to industries or other more inclusive constructs.
- Emphasize the development of cognitive skills, broad technical skills, and understanding of industries at the secondary level.
- Emphasize the use of applications to teach underlying principles (e.g., how electricity works) before teaching occupational procedures (e.g., steps in repairing an air conditioner).
- Use work experience, including jobs students find for themselves, to increase understanding of issues such as how the labor market functions and what skills and personal qualities the workplace requires.
- Prepare most students for some form of postsecondary education (e.g., two-year college, technical college, four-year college) and additional training.

- Defer much, but not all, occupation-specific training to the postsecondary level.

- Be competency-based; be geared to high, external standards; be assessed by valid, reliable methods; and lead to portable certification.

- Allow for other essential courses, such as core academics.

One model of career preparation that includes these elements and is based as much as possible on the findings of the National Assessment is presented below. The model draws heavily on second-wave education reform efforts being planned or implemented. It is not a blueprint, but is intended for the consideration of education policymakers in Congress, the Administration, the states, and localities.

A Reform Model

The general education track in secondary schools should be eliminated and vocational education should be folded into a broad career preparation system for the majority of students. The system would be based on majors in industries or occupational clusters. As the name implies, its goal should be to prepare students for careers, not entry-level jobs. The system should encompass work-oriented and related academic curricula in high school, two-year postsecondary institutions, and four-year colleges and universities.

It is clear that cognitive skills, broad technical skills, and higher levels of education pay off in the labor market. It is also clear that the more cognitive skills and education one has, the more adept at learning one becomes. The ability to learn is one of the most valuable assets an individual can bring into the labor market. As noted earlier, the development of cognitive skills is pivotal at the secondary level, because it prepares students both for work and for postsecondary education. Hence, there is a major advantage to the "front-loading" of these skills in the educational sequence and to the attainment of additional years of education. A student in this system should "front-load" on cognitive skills and on additional education until the marginal benefits of doing so become relatively low, or until it becomes infeasible for other reasons, such as the need to support a family. Thus the extent of front-loading would vary across individuals, who would require different lengths of time to complete their education. Training for specific occupations would be undertaken toward the end of this period, and would not be provided in skill areas for which demand in the labor market was low.

The emphasis on front-loading cognitive skills and on educational attainment must also take account of the fact that work experience can provide valuable skills, information, and motivation to prepare students for careers. In many

areas, occupation-specific skills may be learned better on the job — either in formal work-based programs or through individual participation in the workforce — than in school. Comportment and teamwork skills, flexibility, and adaptability, important attributes in the high-performance workplace, may also be better learned on the job than in school. In this educational model, work experience would be phased in during the latter stages of an individual's preparation in cognitive and technical skills. Such experience could take a number of forms, including jobs individuals obtained on their own, work-based programs such as apprenticeships, or other forms of exposure to work such as job shadowing. A key goal of this process would be to draw more general lessons from the work experience.

General workforce preparation would be a required part of each industry major, or a prerequisite for all. It should include a minimum of one semester's training in computer use, and might include courses such as technology education and an introduction to the labor market.

Majors based on industry or occupational clusters are being tried in some states. They seem to be a good way of providing a framework for the integration of academic and vocational curricula, and providing broad knowledge and skills to career-oriented secondary students. The new Swedish system offers majors in the care professions; economics and commerce; technology and science; technology and industry; agriculture, horticulture, and forestry; and arts and sciences. Many industry fields have analogues in current secondary vocational programs; a major difference is that industry-based instruction focuses on underlying skills and knowledge, rather than on occupationally specific skills.

As in college, the career majors would make up only part of a secondary student's courses. A core of other courses usually deemed essential for broad social literacy and citizenship, such as English, math, and American history, would continue to be required. In some, but not all cases, these subjects could be integrated into an industrial or occupational context — e.g. history of industry, writing for the media. In general, math, English, and science seem to lend themselves best to integrated academic/vocational education.

A liberal arts program would continue to be available at each educational level: secondary, two-year postsecondary, and four-year postsecondary. However, in high schools, the industry-based career majors would be designed to prepare students for several options, including high school graduation with work experience, two-year colleges or technical schools, **and** four-year colleges and universities. For example, secondary health programs would be designed to prepare some students for licensed practical nursing upon graduation from high school; others for two-year postsecondary health technician programs; others for four-year college programs in health care administration; and still others for college pre-med programs. One can easily draw similar examples from other career fields.

For the high school career programs to succeed, it is essential that they include preparation for four-year college for at least some students. Without this postsecondary option, the programs will tend to become second-class operations.

One key to designing multilevel career preparation programs is to assure that they are articulated across educational levels. Tech-prep initiatives are articulating courses and programs in high schools and two-year postsecondary schools. Given the problems in implementing tech prep, it would be premature to try to extend the concept to four-year colleges and universities. Rather, secondary career programs should be designed to assure that students who want to pursue education for careers in college are fully prepared to do so. A very small but growing number of secondary students are currently following such a path by taking a college prep program and vocational concentrations that include advanced courses.

School-to-work transition reforms are among the core elements in this model of career preparation. At each level, career courses, including some occupationally specific vocational courses, would be integrated with academic courses. Tech prep and college prep would both coordinate programs across educational levels. Work experience, whether through formal work-based programs or other arrangements, would be encouraged at both the secondary and postsecondary levels.

Quality, Standards, and Assessment

Improved quality of educational offerings is absolutely essential to the success of this or any other new model of work-related education. The courses must be well-designed, challenging, and interesting, and students should be expected to work hard.

To assure the quality of career preparation, the system should be competency based, benchmarked to high academic and industry standards, and externally assessed by valid, reliable, standardized tests, among other assessment mechanisms. Student performance should be assessed periodically, and students' skills should be certified based on the assessments. Certification should be designed to be portable. External certification and assessment, as a measure of student and program performance, would tend to cast teachers in the role of coaches rather than judges.[30]

The career preparation system would use academic and industrial standards developed under the Goals 2000: Educate America Act, assuming that Level 2 skill standards are adequately developed under the Act. The Departments of Education and Labor are also laying the groundwork for the development of a flexible standardized test capable of assessing skills across industries and occupations.

In theory, student certification could be based solely on demonstrated competence, regardless of time spent in school or the number and kind of courses completed. In practice, competency assessment is subject to some degree of error, and the completion of certain kinds and numbers of courses also may be necessary to assure adequate skill development. Further, a system in which time and coursetaking were completely variable might be too difficult to organize. Nevertheless, the competency-based system of career preparation would be designed to accommodate varying lengths of time for students to achieve a given level of certification.

Career preparation programs, as well as students, should be periodically assessed and certified. The Perkins system of performance standards and measures, together with the use of industrial skill standards and measures, should largely accomplish this goal. Moreover, states and localities should be encouraged to include representatives of business, labor, and perhaps other sectors in their program assessments.

Special Populations

Consistent with the 1990 Perkins Act and other federal laws, special population students must have equal access to the high-quality career preparation programs being proposed here. The same standards and certifications should apply to special population students and to programs with high proportions of special populations as apply to other career students and programs. However, they should have more help and more time, as needed, to ensure they can meet the standards.

The 1990 Perkins Act targeted resources to localities with high concentrations of special populations and emphasized improving the quality of vocational education in those sites. The provision of services to special population students was also encouraged, and it is our impression that educational administrators in many localities still regard services as a special population entitlement that has the advantage of providing a clear audit trail. In general, we think that much of the money spent on services could be better spent on reforming and improving the quality of occupational programs. Districts and schools serving high concentrations of special needs students are likely to need the most assistance in implementing reforms such as those outlined above, and federal funds should continue to be targeted on them.

The State and Federal Roles

The new Perkins Act should encourage states to take the lead in developing and implementing career preparation programs such as the one outlined above. Evidence from our surveys and case studies show that states can be effective education reformers if they are resolved to do so, and a number of states are

already pursuing such reforms vigorously. We think that state leadership is the best bet to give context, shape, and direction to the diverse local reform activities already under way, and more broadly, to convert them to coherent career preparation programs.

The role of the federal government should be to set a flexible agenda; provide resources to facilitate its implementation, through such measures as the development on industry standards and curricular material; help assure the access of special populations to reformed and improved programs; and conduct rigorous assessments of these programs.

ENDNOTES

1 National Center on Education and the Economy (1990). *America's Choice: High Skills or Low Wages*. Rochester, NY: Author.

2 Ibid.

3 National Commission on Excellence in Education (1983). *A Nation at Risk: The Imperative for Educational Reform*. Washington, DC: U.S. Department of Education.

4 Section 403 (b) (3).

5 Sections 113 (a) (3) (B) and 235 (b) (1) (a).

6 Section 403 (b) (5).

7 Section 403 (b) (5).

8 Armed Services Vocational Aptitude Battery.

9 Section 403 (b) (6).

10 Section 403 (b) (5) (A).

11 Section 403 (b) (1).

12 Section 403 (b) (7).

13 Section 403 (b) (5) (C).

14 Section 235 (c) (1) (B). Section 403 (b) (5) (B) requires the National Assessment of Vocational Education to examine the "extent and success of integration of academic and vocational curricula."

15 Section 235 (c) (2) (L).

16 Section 403 (b) (8).

17 Sections 118 (a) (1); 118 (a) (2); and 235 (a).

18 Section 403 (b) (4).

19 Sections 231 (a) and 232 (a).

20 Sections 235 (c) (1) (C) and 240 (5).

21 Sections 403 (b) (2) and 403 (b) (8).

22 Sections 118, 111 (c), and 115 (b) (3).

23 Section 102 (a) (2).

24 Section 101 (a) (1) (b) (i).

25 Section 102 (a) (5).

26 Section 403 (b) (10).

27 Section 102.

28 Section 403 (b) (1).

29 Section 403 (b) (9).

30 This observation is taken from Bishop, J. (1993b) *Incentives to Study and the Organization of Secondary Education*, pp. 23-24. Ithaca, NY: Center for Advanced Human Resource Studies.

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